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
# University of California Publications in Philosophy

VOLUME 4

GEORGE P. ADAMS

J. LOEWENBERG

EDITORS

  
UNIVERSITY OF CALIFORNIA PRESS  
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# ISSUES AND TENDENCIES IN CONTEMPORARY PHILOSOPHY

LECTURES DELIVERED  
BEFORE THE  
PHILOSOPHICAL UNION  
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1922-1923



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## P R E F A C E

The papers comprising the present volume were read before the Philosophical Union of the University of California during the year 1922-1923. The Philosophical Union has, since its founding in 1889 by Professor George Holmes Howison, provided many occasions for the serious discussion of philosophical themes. The contributors to the present volume were not unmindful of the fact that they were primarily addressing a general public rather than their professional colleagues, and it is believed that the publication of the annual lectures will appeal to a still wider audience, similarly concerned with the vital problems of philosophy. The plan thus inaugurated will, it is hoped, be continued in the future.

The choice of topics was dictated by the desire to throw some light on philosophic issues now in the foreground of attention. While it is true that each writer has approached his theme from an individual focus or perspective, yet the volume as a whole is not wanting in unity. The title which the volume bears is the one which was originally given to the entire series of lectures, and of its significance each writer was fully conscious. With but one exception, the papers are printed in the order in which they were read. Although they were not presented in immediate succession, it has seemed preferable to group together the two essays on the Problem of Value. The dates upon which the papers were read are as follows:

October 6, 1922: The Anomaly of Knowledge.

October 27, 1922: The Present Status of the Theory of Value.

November 24, 1922: The Nature and Habitat of Mind.

January 26, 1923: The Philosophical Aspects of the Theory of Relativity.

February 23, 1923: The Equivocation of Value.

March 30, 1923: The Metaphysics of Critical Realism.

April 27, 1923: Whitehead's Philosophy of Nature.

THE EDITORS.

BERKELEY, October 4, 1923.





THE ANOMALY OF KNOWLEDGE

BY  
ARTHUR O. LOVEJOY

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# THE ANOMALY OF KNOWLEDGE

ARTHUR O. LOVEJOY

## I

There are two or three familiar ways of distinguishing the province of philosophy from that of the other sciences which, though not untrue, conceal an important part of the truth. The most generally prevalent notion of the matter, I suppose, is that philosophers constitute a variety of the human species characterized by a peculiar craving for comprehensive generalizations, for *vues d'ensemble*—that they are men who cannot rest content with fragments, with partially unified knowledge, but demand a synoptic vision of the nature and meaning of things as a whole. According to another account, the philosopher is primarily distinguished, not by the greater breadth of generalization of the knowledge that he seeks, but by its logical priority. The questions which it is most characteristic of him to ask are not the last but the first questions. He scrutinizes long and critically the tools which the special sciences unhesitatingly use, and raises more exigent doubts than either science or common sense are wont to face. The trait distinctive of his intellectual temperament is—to change the figure—conceived to be an obsessing curiosity and concern about the *foundations* of his structure of belief, and consequently a more far-reaching and resolute skepticism than is natural to the generality of our easy-going kind or is customary with those who build the towering superstructures of science. Or again, the philosopher is sometimes said to have, not, indeed, for his only province, but for his most characteristic and perhaps his only permanently

inalienable province, the realm of values, especially of moral and aesthetic values. While the natural sciences represent man's attempt to correct, to systematize, and to extend his judgment of fact, his knowledge of things as they are—or, in the case of the applied sciences, to discover the best means to desired ends—philosophy alone, we are told, is mindful that men also, constantly and irrepressibly, make judgments of worth; that these too require correction, systematization, and extension; that the criticism of ends is not less a part of the life of a rational animal than the intelligent choice of means; and that the question of ultimate human interest is the question how the good stands related, in this world of ours, to the real, how far values have a basis and a backing beyond the transient likings and dislikings of our feeble race.

One or another, and in not a few cases all three, of these accounts truly enough describe propensities and preoccupations of those whom it has been customary to call philosophers. Yet I think the effect of the emphasis upon these aspects of the philosopher's business, and especially upon the first two, has not been wholly fortunate. That business is made to appear very widely different in kind, and in temper, and in its pretensions, from the work of the scientific investigator; and the philosopher has often, I suspect, had to his scientific *confrères* the look of a rather queer fellow, either dangerously disposed to hasty generalization; or else full of barren doubts and hesitations about things that all other men take for granted, and have so taken for ages with the happiest results; or else so infected with moralistic preoccupations, so eager to find the edifying in the real, that his inquiries into any question about reality are open to the gravest suspicions of emotional bias. However unjust such conceptions of most philosophers and most philosophy may be, they have, I think, some currency; and while I should not wish to see the philosopher abandon these three interests, or abdicate his claim to these provinces of thought, I think it may help to make him more intelligible to

other animals of his species, and especially to workers in the natural sciences, to point out another aspect of his business which is hardly made evident by the accounts of the field and purpose of philosophical inquiry that I have mentioned. There is, I suggest, a special class of empirical matters-of-fact which—with one possible and ambiguous exception—none of the other sciences investigates or is, for reasons which will presently appear, in a position to investigate. And this class of empirical matters-of-fact constitutes the starting point and primary subject-matter of the sort of philosophy with which I am here concerned. The philosopher, as I conceive of him, is first of all a man whose interest and desire to understand have been aroused by a certain biological phenomenon, and who therefore becomes a specialist in the study of that type of phenomenon. Doubtless he should be more than that; but he ought never, I think, to be less; and in any case, that is what many modern philosophers essentially are.

The class of biological phenomena to which I refer is that consisting of making judgments about things, having doubts about them, having knowledge about them. Whatever more knowing may be, it is on the face of it, and in the first instance, a phenomenon sometimes occurring in the life of the organism man, a function of which the featherless biped is capable; and it is as such, and without other preconceptions than those of the man of science, that the philosopher does well to approach it. Its empirical occurrence is at least as certain as the occurrence of any other phenomenon; for being certain of anything either is or purports to be an instance of this phenomenon. Its occurrence is, indeed, more certain than that of any other phenomenon; for being *uncertain* is also a variety of the same species of biological happening. In other words, knowing is a natural event that is taken for granted by biology and all the other sciences. But it is not *investigated* by biology, or by any of the natural sciences, with the dubious exception of psychology. The psychologist might but usually does not



investigate it with thoroughness. Clearly, then, there is here a class of facts which it ought to be somebody's business methodically to describe, to analyze, to correlate with other facts. That business has historically fallen, and still falls, to the lot of the persons conventionally described as philosophers; and discussions relating to these matters form pretty certainly, I think, the most voluminous and characteristic part of contemporary philosophical literature.

The primary relation, then, of the philosopher to other men, including biologists or other specialists, is much the same as the relation of the biologist to his infusoria or other organisms, of the geologist to the processes of rock formation, of the astronomer to the celestial bodies and their motions. The biologist observes the infusoria and endeavors to reach conclusions concerning the nature of their activities and what is implied by them; the philosopher may be said to observe the biologist—or any other creature that is supposed to know anything—to ascertain precisely what it is that *he* is doing *when* he is reaching conclusions, and what is implied therein—not in the specific conclusions, but in the fact that he reaches them, and that, if there be any science at all, some of them constitute what we call knowledge.

There has, it is true, taken place in recent philosophy a curious revulsion against the customary name of this special inquiry into knowledge, and to some degree, also, a revulsion against the inquiry itself. Epistemology has become a word taboo among certain circles of—shall I say?—epistemologists. A former lecturer on the Mills Foundation writes as follows:

—The astronomer, the biologist, the chemist, the historian, the student of literature . . . are all engaged in increasing our knowledge of what our perceptions are and how they are related to one another. Their studies are not prefaced by an examination of how we perceive. They take their material as so much given stuff, and then proceed to tell us what, when so taken, they perceive it to be. If they are invited to examine first the mechanism of perception, they regard the invitation as impertinent and irrelevant. They have found such an examination unnecessary, and so believe that they can rightfully reject it. . . . The results of modern intel-

lectual inquiry [have been built up] directly from considering the processes of perception, and also the results of those processes, without seeking any epistemological warrant for our procedure.<sup>1</sup>

Professor Woodbridge therefore deprecates epistemological inquiry into perception, and presumably into other modes of knowledge. Many scientific investigators, I suspect, have experienced a similar feeling of irritation at the curious pre-occupation of philosophers with epistemology—their tendency to loiter in the vestibule of science, to spend their time in looking over the instruments of knowledge, instead of using them.

I refer to this state of mind in order to make it clear that the study of knowing of which I am speaking is not exactly the sort of thing that is referred to in the passage of Professor Woodbridge's which I have quoted; nor are the reasons for engaging in it the reasons which he rejects as invalid. I am not contending here that epistemology is a necessary propaedeutic to natural science, or that an experimentalist ought to await a license from the philosopher before entering upon his own business. Epistemology, as I conceive it, is not a preliminary and it is not a normative science; it is merely one descriptive or analytic science among others. But its results, when reached, will require to be correlated with those of the other sciences, will supplement and qualify their conclusions, will, perhaps, restrict generalizations to which we might be led if we considered solely the data of those other sciences. Such a study of knowledge needs no more special or peculiar justification than any other study. Since knowing is an actual phenomenon presented in our experience, there is the same sort of reason for finding out what we can about it as there is for finding out about other things. The prosecution of epistemological inquiries is sufficiently justified by the undeniable fact that their subject matter exists—unless, indeed, it should be maintained that man, and man engaged in the function most characteristic of his

<sup>1</sup> F. J. E. Woodbridge, "Perception and Epistemology," *Essays in Honor of William James* (1908), p. 142.

species, is an animal less deserving of study than the *paramoecium* or the dancing mouse.

The inquiry I speak of, then, should begin—where it will end is another question—with a plain descriptive account of what knowing is, what goes on when it occurs. Only it must be an account of *knowing*, and not of something which happens to be associated with it. And here certain obstacles to the serious study of this phenomenon have arisen through entirely natural and comprehensible causes. In the first place, since knowing is, in a sense, the thing we know best of all—since it is what all men are doing, or supposing themselves to do, during most of their waking life—it is difficult to arouse in most men, and, I sometimes think, especially difficult to arouse in men of science, sufficient intellectual detachment from this phenomenon to permit them to feel a philosophic wonder concerning it, or even to observe with particularity just what it is. Many collateral questions are, indeed, often raised with respect to it; but for the prime question: Precisely what am I doing when I know—or what should I be doing if I were correct in supposing myself in any given instance to know?—for this prime question it is often hard to get consideration. This is, I think, further due to two developments in the history of science which have tended to substitute for this question other questions which look like it but are not in reality the same. The first of these—a natural consequence of the legitimate custom of the physical scientist to forget the knowing he is engaged in and to fix his attention upon the object—is the substitution of a description of the physiological conditions of knowledge for a description of knowledge. I am not assuming at this point that a physical account of man's cognitive function cannot be given; I am merely pointing out that you certainly have not described a case of knowing when you have merely described the movement of a number of molecules, or still more minute units of matter, in the animal's brain and nervous system, with accompanying changes in their electrical charges. These movements may be



conditions without which knowing cannot happen in the human organism; but to study them is to study the correlates of the phenomenon of knowing, not to observe and analyze the phenomenon itself. It is at least what it is experienced as being, though it may be more; and it is assuredly not experienced as being a movement of molecules under your cuticle or within your cranium. This is an awkward sort of remark to have to make; for some of my readers are sure to regard it as a truism too obvious to need mention, and others are likely, in these days, to regard it as an unintelligible philosophical prejudice. To the former I make my apologies; to the latter I address the suggestion that one of the pregnant causes of muddle in contemporary thought, especially in the case of some of those given to taking the name of 'science' in vain, is precisely a tendency to treat things as being what they observably are not, by substituting a description of their causes or concomitants for a description of the things themselves—especially when the concomitants are readily amenable to the methods of investigation and the principles of 'explanation' of the physical sciences, and the things themselves are not.

The other tendency in nineteenth-century scientific thought unfavorable to an appreciation of the nature of and necessity for a direct examination of the organic phenomenon of knowing has been observable in evolutionary, and especially Darwinian, biology and in the vogue of what is called 'functionalism' in psychology. It is a tendency in a sense the reverse of the preceding—namely, to substitute the question what knowing *does* for the question what knowing *is* or consists in; to offer a description of the thing's effects and uses in lieu of a description of the thing itself. General surveys of organic evolution are accustomed to mention the gradual development of intelligence in the higher animals, culminating in the scientific and technological activities of man, and to point out the new adaptations and new ranges of physical action which this made possible. Such a study of the rôle of mind in evolution is assuredly of

and aspects, probably for the most part visual aspects, of a thousand differing groups of animate and inanimate bodies and of their movements. But the world of the physical sciences is not at the same time suddenly augmented by this rich, chaotic, fleeting mass of new material. For no physical observation discloses to the investigator, watching the thousand silent human organisms, the presence of these memory-objects; and even if this were not true, the entities which such observation revealed would find no place in the system of physical science. These quasi-bodies, or substitutes for bodies, which have no mass, which are not bearers of energy, which jump about in space—at least in *some* space—in the most erratic and discontinuous manner, do not and should not *as such* figure in the analyses of the chemist or the equations of the physicist—even of the physicist since Einstein. True, the scientific investigator will presumably find some difference between the neural processes of the thousand persons in the case when they are directly perceiving an (approximately) coëxistent object or event, and the case when they are remembering past objects or events. But what the thousand themselves are experiencing is not the neural processes; and the difference for them between the two cases is not stated, certainly is not exhaustively stated, in terms of the differences between the two neural processes. What they now have present in their environments are more or less confused and blurry visual aspects of schoolhouses, teachers, schoolmates. Of their actual environments, of the surroundings with which their organic life is now really occupied, these things are even more certainly a part than are the unperceived though temporally coëxistent changes in nerve fibers and cerebral cortex.

The same is true, of course, of all objects, other than immediate sense-data, about which any science claims knowledge, when we consider these objects, not in themselves and as of their own date, but as items in the present experience of the man of science. Dinosaurs are happily extinct upon our globe, and therefore, so far as we know, they are not a part of the

environment of present sub-human animals. But they are certainly in some sense a part of the environment of present geologists—in the two specific senses, namely, that the geologists have these creatures actually, though not sensibly, within their present fields of consciousness, are ‘referring to them,’ and that the geologists’ reactions to the sense-impressions which they are at a given time receiving are modified by the presence of these other items in their content of experience. The effect, it is true, is curiously unilateral; the dinosaur, by being known, now makes a difference to the geologist, but the geologist by knowing makes none, or none of the same kind, to the dinosaur; and the *kind* of difference which the dinosaur makes to the geologist is fortunately very unlike that which he would probably have made, if the two had physically, and not merely cognitively, coëxisted. But the significant and anomalous fact remains that, when exercising the function of retrospective knowing, the organism has to do—and, since knowledge of the past is the guide of practice, has to do in a highly practical way—with things which are not physical realities at the time when the organism is a physical reality and while the knowing is going on. When a knowing animal first appeared in the course of evolution, many prior events and vanished objects, though in one sense remaining as past and irrecoverable as ever, were in another sense rescued from the maw of the all-devourer. In short, then, when you make a valid retrospective judgment, some bit of the past, as we say, comes ‘before you’; and it is *now* that it is *before* you; and nevertheless it is *before* you *as* past.

The same characteristic of the knowing experience is, of course, often put in other terms, which merely express a complementary aspect of the same fact. I have been speaking of the phenomenon of knowing with reference chiefly to the peculiar status of the objects known, as entities not at the moment of knowing to be found in physical nature, yet, somehow, quite unmistakably factors at that moment in a physical organism’s total environment. Stated on the other hand as a function of



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the organism, knowing consists in a power which the organism has to reach beyond, to transcend, both the place and the date of its own existence as an observable object in nature. It is able to range up and down through time, annulling in some measure the transiency of things; to penetrate also into the world of the unborn and thereby to make it possible for the cognitive animal to be affected by events which have not yet happened and to adapt itself to things that have not yet entered into nature—though, happily no doubt, it possesses a far more limited vision in that temporal region than we commonly believe it to have in the region of the past. Whatever the specific content of knowing, in whatever direction of time or space it is, in any given instance, turned, it proves to be generically an organic process characterized by a reference to, an evocation and apprehension of, a spatial and temporal Beyond, to which the physical sciences offer us no counterpart among the phenomena which they describe. This, I repeat, is not presented as a theory or an inference, but as a mere description, and a description of the obvious—but not of the unimportant. If there is any such thing as knowing, then that is what it is; whenever anyone asserts that he has a knowledge of anything more than the blank, momentary, uncorrelated content of his present sensations (which we do not usually term knowledge), he is asserting as a fact the occurrence of the type of organic phenomenon which I have been describing. To recognize this simply as a fact, an empirical datum, and as a fact which constitutes a *prima facie* anomaly among the phenomena of nature, is, as it seems to me, the beginning of wisdom in philosophy; to endeavor to connect the fact intelligibly with other facts, to elucidate and, if possible, to alleviate the anomaly, is a large part of the philosopher's task. "Just why and how," writes W. P. Montague, "a system of mere cerebral molecules should have this self-transcending reference is in my opinion the key-problem of philosophy." Though I do not find Montague's very original and ingenious solution of the problem satis-



factory, I am entirely at one with him in this emphasis upon the primacy and decisiveness of the problem itself.<sup>2</sup>

It will, however, already have been perceived that the apparent anomaly of knowledge of which I have been speaking is really twofold—that there is a lesser and a greater anomaly. These should now be formally distinguished. (1) The lesser anomaly is the one which arises when you view the phenomenon of knowing from the standpoint of physical science; and it consists in the fact that there exists an organism, itself physical, which at some moments of its life has as items in its experience, as factors in its environment, things that are not, at those moments, any part of the sum of masses and motions and forces which, for the natural sciences, then constitute the physical world. That fact is so queer and troublesome to a good many contemporaries who have been trained in the categories and presuppositions of natural science, that they feel the strongest possible repugnance to admitting it—and in some cases may be seen denying on purely a priori grounds that it is a fact. To the consideration of these bold and simple methods for getting rid of the lesser anomaly we shall return presently. (2) The greater anomaly consists in that peculiarity of knowing which philosophers call ‘meaning’ or ‘transcendent reference’; that is, in the fact that when we know we appear somehow to have within the field of our experience at a given moment objects which we must at the same time conceive as existing entirely outside of that field—for example, as having their being at a time other than the time of the knowing of them. The anomaly here, at first sight, and so long as the philosopher is able to offer no conceptual device for alleviating it, seems to look much like

<sup>2</sup> Montague observes that in causality there is a similar relation of present and past. A prior event may be in some sense said to be present in its effects; and thus in any organic response the organism is really concerned with past (and with future) entities or events. Finding, then, a certain analogy between knowing and a relation which pervades all nature, Montague boldly identifies cognition and causation. Unfortunately the analogy breaks down at the critical point. A cause is *not*, as such, recalled or ‘represented’ in its effects in the *same* sense in which a past experience is recalled in memory. We do not, for example, always remember the errors from which we suffer.

a logical paradox. It is not merely that, in knowing, some organisms deal with entities which are not *physically* coëxistent with the organisms themselves, or with their present exercise of the knowing function; the greater anomaly is that these entities—at least in the case of retrospective and anticipatory knowledge—must apparently be said not to coëxist *at all* with the organism, or with the particular exercise of the cognitive function through which they are known. Yet how can I in any way have to do today with that which does not exist today, which is not a reality contemporaneous with myself? How can a being whose activities are all in a fleeting present, and the entire sum of whose knowings falls temporally within a brief span of years, really behold that which was ages before it, or shall be decades, possibly centuries, after it? When a distant and unperceived object or a past event is known, it seems plain that it must be present to the knower; but it also seems plain that it is truly known as what it is—namely, as distant or as past—only if it is spatially or temporally absent. It must be content of present experience; and yet what is known *about it* is that it is *not* content of present experience. In knowledge, in short, as Dewey has put it—in a phrase which I perhaps quote too often—something must be “present-as-absent.” But that, obviously, is a rather peculiar way of being present, which calls for elucidation.

Common sense has, of course, long had its own way of dealing with these anomalies—a way followed also, until recent times, by many philosophers and most psychologists, but now increasingly out of fashion among both classes. The apparent oddity that a thing absent should, when known, become present (while still remaining absent), and that a thing bygone should in some manner and some degree become coëxistent with a living organism, disappears—according to this long established *interpretation* of the fact of knowledge—when that which is present is regarded as a partial and immaterial *simulacrum* of a past or otherwise absent object, this shadowy replica being

called an 'image' or 'idea.' The present-ation, or making present, of the absent, in which knowing consists, is declared to be simply a representation—not in the etymological sense of a literal 'making present over again,' but in the sense of 'effective substitution.' The object is represented by an understudy or deputy or surrogate, not having all the powers or attributes of its principal, but sufficient, it is assumed, for all cognitive purposes. But this simple and familiar way of construing the phenomenon of knowing, as a mere occurrence of what are called 'mental images,' manifestly does nothing to eliminate the lesser anomaly; and it has been held by a number of philosophers of different schools that it is incapable of elucidating or alleviating the greater. If "ideas" are conceived of as a sort of psychical stuff indispensable to the organic function of knowing, then the assertion of their existence does but increase the anomalous appearance of that function from the point of view of natural science. That assertion would compel biology to one or another troublesome conclusion. One alternative would be to hold that at a certain stage of evolution an animal appears which produces a species of intangible, imponderable, immaterial secretion, extended, yet not localizable in any space of which the biologist or even the relativistic physicist takes cognizance; and that this secretion has the extraordinary property of reproducing, with some loss of vividness, past phases of the organism's life, and even bits out of the physical world as it was before the organism's birth. The other alternative, to which biology would apparently be constrained, if it admitted ideas as a feature of the life of human organisms but rejected the conception just mentioned, would be the attribution to *all* organisms of the power to throw off these imponderable secretions. And the question would arise in either case, but in the latter perhaps more insistently, whether this function could, after all, be supposed to be wholly otiose in the determination of animal behavior or even vegetal response—whether it is reasonable to assume so vast a redundancy in nature as



that hypothesis would imply. The hypothesis of ideas, then, would in any event fit into the habitual preconceptions of the biologist, and into the general theory of biological evolution, only with difficulty and at the probable cost of some revision of those preconceptions. Dewey somewhere remarks that such a hypothesis "can be accepted by one who accepts the doctrine of biological continuity only after every other way of dealing with the facts has been exhausted."

And to many, as I have said, the theory of representative ideas seems at worst to aggravate, and at best to be unavailing to lighten, the greater anomaly. Some of those who take this view of the common-sense explanation of knowing do not deny the reality of ideas or images; but they point out that these are insufficient to render the present apprehension of absent objects intelligible. For what we mean by 'knowing' evidently is not at all equivalent to what we mean by simply 'having ideas.' Human creatures obviously (if they have ideas at all) have many such which do not even purport to constitute knowings; and all that do purport to do so seem to involve something more than the simple presence of certain ideas in a given field of consciousness. If the geologist professes to know anything about the fauna of the Jurassic period, he is not merely reporting the emergence in his thought of various 'mental pictures' of queer beasts. A poet may be content to tell us of his images as they rise, but not the man of science. A scientific statement is not intended to be taken merely as a contribution of the scientist who propounds it to introspective psychology. To know, in short, even supposing that it requires the occurrence of 'ideas,' requires also a judgment in which these ideas are recognized as disclosing, or corresponding to, something not identical with themselves in its time and place of existence and in many of its attributes.<sup>3</sup> The present simulacrum alone cannot, for

<sup>3</sup> Some Berkeleyan idealists may demur at this remark. Suffice it to say that any of my readers who do not suffer from total amnesia or do not suppose themselves to have been born simultaneously with the beginning of this sentence are realists enough to be committed to a recapitulation of some cases of the kind of knowledge here referred to.

cognitive purposes, take the place of the absent object or the past event. Even its factual correspondence with a past event is not enough; the correspondence must be *apprehended*, the idea must be *referred to* the object, before there can be the reality or even the appearance of knowledge. And this means that the absent object also, when knowing occurs, must be within the conscious field of the cognitive organism; that it, as well as the idea of it, must, as the common phrase goes, be 'before the mind.' You cannot, it would seem obvious, 'refer' an idea to something else of which you say it is a representation without at the same time having the something else present to your thought. And thus it is contended that the hypothesis of ideas, whether well founded or not, does not serve to remove or even diminish the apparent paradox of the presentness of the absent in the cognitive experience. The ideas do not, it is urged, bring you any nearer to the object; on the contrary, they interpose themselves between the knower and the object, and make it more difficult than before to conceive how the knowing function attains its objective.

I now pass on to present some illustrations of the part played by these two anomalies of knowledge in recent and contemporary thought, some specific examples of the diverse reactions of philosophers upon them.

## II

No one, I think, ever felt the greater anomaly more strongly nor expressed it more effectively than our own Californian philosopher, Josiah Royce; it seems, if one may judge from the argument of his first book (*The Religious Aspect of Philosophy*), to have been the difficulty through reflection upon which his own metaphysics was generated. His reasoning on the point is, I am sure, familiar to many here, but as I cannot assume that it is so to all, it is worth while to recall it. A case of knowledge, Royce observes, is generally defined as a judgment

that agrees with its object, and error as a judgment which fails to agree with its object. In either case it is assumed that the judgment—the knowing or would-be knowing—*has* an object wherewith it can agree or not agree. This assumption Royce accepts. But he points out that you get into difficulties as soon as you raise the question: What is meant by *the* object of a judgment? If a judgment is to have an object of its own,

there must be something about the judgment that shows what one of the external objects beyond itself this judgment does pick out as its own. A judgment has as its object only what it intends to have as object. . . . But the essence of an intention is the knowledge of what one intends. . . . So then judgments err only by disagreeing with their intended objects, and they can intend an object only in so far as this object is known to the thought that makes the judgment.

In other words, the absent object, if it is to be discriminated from all other absent objects and now recognized as the object-now-referred-to—if it is to be ‘spotted’ or identified at the moment of knowing it—must be compresent with the thought of it, must be given in consciousness along with the idea whose recognized as well as actual agreement with it would constitute knowledge. But on the other hand, it seems impossible that the object-referred-to should be thus compresent. For if it were, error would be impossible. I cannot err with respect to what is actually and totally given within my present consciousness. Thus it appears necessary to say that when anyone knows, or even errs about, any definite object or situation, he must have before him, as a thing now literally given in consciousness, the actual object of his judgment, in order that he may recognize it as that which his judgment is about and at the same time contrast it with his conceivably erroneous idea of it; and it appears equally necessary to say that the actual object *cannot* be literally given in consciousness, since if it were, his idea of it could not conceivably be erroneous—and (as we may add) its true temporal externality to the knowing and to the idea could not be asserted.



Such is the seeming paradox of knowing which Royce felt it to be the primary task of philosophy to remove. But his conclusion was that it can never be removed so long as we conceive of knowing only as a temporal event in the life of a human organism. By no finite knower is the required conjunction, in a single moment of consciousness, of idea and object-intended achieved. Only by assuming that there is a more comprehensive consciousness within which that of every finite knower is contained, and for which the idea and its object and the relation which unites them are all simultaneously compresent, can we escape from the paradox. And this larger consciousness must, of course, be an eternal, a non-successive, consciousness. In Royce's own words:

To explain the possibility of error about matters of fact seemed hard, because of the natural postulate that time is a pure succession of separate moments, so that the future [or past] is now as future [or as past] non-existent. Let us then drop this natural postulate, and declare time once for all present in all its moments to an universal all-inclusive thought. And to sum up, let us overcome all our difficulties by declaring that all the many Beyonds, which single significant judgments seem vaguely and separately to postulate, are present as fully realized intended objects to the unity of an all-inclusive, absolutely clear, universal and conscious thought, of which all judgments, true or false, are but fragments. . . . Then all our puzzles will disappear at a stroke.

But for whom do they disappear, one must ask. Doubtless they disappear, or have never existed, for the supposed time-transcending and universal Knower, since he by hypothesis has all things compresent to him. But does this make them compresent to me? And if not, does it in the least solve the puzzle how *I*, temporal creature that I am, can ever know anything, or even be in error about anything in particular? The cases of knowing we are concerned with are knowings which occur at this date or at that, as incidents in the life of this or that human organism. It will not serve to say that all these organisms are, by the hypothesis, fragments of the Absolute, that it is the eternal and all-inclusive Mind that thinks through their poor transitory

thoughts. Even if this were true, it would still be in their fragmentariness and transitoriness that men must know, if *they* are to know at all; and we are assuming that they, and not merely the Absolute, sometimes do know. The problem therefore remains entirely unaffected by the monistic idealist's proposal that—in a homely phrase—we should have all our knowing 'done out.' So far as the present complication is concerned, the Absolute is not even a god out of the machine; he is a god who remains forever upon the Olympus of his eternity, helpless to straighten out any of the tangles which arise upon the actual temporal stage of human knowledge.

Whatever, then, be the difficulty of dealing with the greater anomaly within the limits of human experience, it is within those limits, if at all, that the escape from the seeming paradox must be reached; and we may, I think, set it down as a principle on which a large majority of contemporary philosophers would be found agreed, that the peculiarities of knowing are not rendered more intelligible by supposing that organic function to be carried on always with the supernatural assistance of an omniscient and eternal Mind.

### III

Contemporary Anglo-American philosophy is chiefly distinguished, as it seems to me, by the number and energy and ingenuity of the efforts made to escape from both the anomalies of knowledge, and by a convergence of the efforts made on the one side and on the other toward a repudiation of the old hypothesis of representative ideas. In other words, motives arising through reflection sometimes upon one, sometimes upon the other, sometimes upon both, of these difficulties, incline several otherwise discordant schools in philosophy and psychology to hold that the notion of ideas, as present 'mental,' *i.e.* non-physical, content through which knowledge of things absent in time and space is mediated, must once for all be given up.

Of many it is now undeniably true that, as Dunlap has declared, the "world of representational 'ideas' or 'states of consciousness,' dim shadows through which we may look at the objects casting them, or on which alone we may fasten our gaze, attracts no longer faith or interest."

When based solely upon an aversion for the first or lesser anomaly of knowledge, these attacks upon the belief in ideas often take a very simple form. There can, we are sometimes told, be no such things as ideas or mental content or mental states, no non-physical element in cognition or other modes of what is called consciousness, for the sole and sufficient reason that such things *are* anomalies from the point of view of the natural sciences. This view is perhaps most often expressed by psychologists of a certain type, with respect to the procedure of their own science. These lay it down as a fundamental rule, primarily for their fellow-specialists, but by implication for all who would make any pretensions to scientific respectability, that no "mental" or "psychical" factors shall be admitted within the purlieu of science. "As long as psychology deals with conscious or mental states of any sort," writes one representative of this fashion<sup>4</sup>—so long as psychology does this, "it cannot attain to the dignity of a science, as Kant long ago asserted." (Kant, I may interpolate, has been credited at one time or another with the paternity of many doctrines; at none of his reputed speculative descendants would he have gazed with more amazement, and less sense of family likeness, I suspect, than at this latest claimant.) To quote again from the same writer: "Clearly there can be no science which has as its subject-matter intangible and invisible subjectivistic states. . . . If we assume that what is studied in psychology is the development of the complex reaction-patterns and the means whereby they are put into complete or incipient function by various types of stimuli, we need never invoke any mysterious [you observe this word seems here synonymous with 'non-physical']—any mysterious

<sup>4</sup> J. R. Kantor, in *Psychological Review* (1920).



or inscrutable entities.” To the mere logician, all this necessarily has the appearance of the ancient trick of question-begging definition, done on the grand scale. You first define a “science” in such a way that no study of “consciousness” or “mental states” or activities or content—even if by any chance they should happen to exist—would conform to the definition; you then define psychology as a science. You further tacitly assume that nothing that is *not* the potential object of a science (as defined) can exist—or at all events be known to exist—and so, by means of these convenient verbal premises, most of the problems of psychology, not to say of epistemology and metaphysics, are settled for you at the outset by a single stroke. You are no longer under any troublesome necessity of examining the facts in each case with an open mind, in order to make certain whether, in some obscure corner of human experience, there may not peradventure be found lurking some “mental thing.”

It is, for example, suggested by psychologists who are still under the influence of what the writer quoted calls the “mentalistic tradition” that the experience commonly called perception is (as Stout puts it) “essentially cognitive,” and that it “involves a reference to an object present to the senses.” The psychologist who uses the *a priori* premises indicated does not need to analyze perception, as he himself experiences it, in order to assure himself that such a view as Stout’s is mistaken. It is enough for him to note that if that view were admitted it would bring back into psychology those troublesome alien enemies whom he is resolved to exclude from it. If *he* is to give a description of perception it must be one which “consistently complies with the rigorous canons of natural science,”<sup>5</sup> and since those canons expressly forbid him to deal with “conscious or mental states of any sort whatsoever,” he knows, before addressing himself to the phenomenon to be described, precisely

<sup>5</sup> Kantor, *op. cit.*, p. 192; the following quotations are from the same article.

what kind of elements should, and what should not, be found therein. His account of the facts, in short, must be made to fit a dogmatically predetermined formula. "Only upon the *assumption* that the perceptual reaction is a natural psychophysiological response," observes the writer last quoted,<sup>6</sup> "*may we hope to escape* the arbitrary and confusing concept of a mental content, *which is an unavoidable consequence of the presupposition that perception is a knowledge process*"—i.e., that it is "the consciousness of an object present to sense." An investigator who, dealing with a concrete factual question, "assumes" what may be necessary to enable him to avoid a consequence which he "hopes to escape"—is not unlikely to have his hope realized.

This sort of thing—which I mention because there appears to be a good deal of it going on in present-day American psychology—manifestly violates, in the name of science, the most elementary principles of scientific method. "Thou shalt not settle questions lying in the region of empirical fact by a priori arguments drawn from definitions"—this first commandment of science, at least, one might have supposed to be sufficiently promulgated; but the writer quoted argues as if he had never heard of it. Yet there is one thing admirable in the passage cited; it is the candor of the admission that if perception—or by implication, any other function of the organism—is regarded as "cognitive," as a "knowledge process," then "the confusing concept of a mental content" must be accepted "as a necessary consequence." In other words, what we have here is a heroic endeavor to escape, primarily from the lesser, but in fact from both, the anomalies of knowledge, by denying the reality of knowledge altogether. And this is the essence of the view of the school of psychologists known as behaviorists—at least of that straiter sect of them who alone, as it seems to me, have a valid title to the name. The fact is not always so clearly recognized or so plainly expressed as by Kantor; yet, implicitly

<sup>6</sup> Kantor, *op. cit.*, italics mine.

or explicitly, behaviorism amounts to the proposition that cognitive phenomena are not legitimate subjects of scientific inquiry—a view which inevitably develops, and has as a matter of historical fact developed, into the thesis that those phenomena do not really occur—that there are no functions or “reactions” of an organism which cannot be described in terms of (theoretically if not always actually) observable motions of the portions of matter composing the organism’s body. The best known representative of behaviorism, seeking some particular motion of matter which can be regarded as the specific ‘behavioristic’ fact corresponding to what has commonly been called ‘knowing,’ finds it in the movements of those muscular mechanisms, chiefly in the region of the larynx, which are concerned in speech. When you have described these you have, he believes, told the whole story about thought and knowledge. As for ‘ideas’ or ‘images,’ those terms are mere nonsense-words, standing for no fact of experience at all.

But manifestly this is a description of knowing with all the knowledge left out. It bears not the least resemblance to what anybody—including the behaviorist—means by knowing, and claims for himself when he professes to know. It states wholly in terms of alterations of position of physical particles within an organic body a function which, as we have already seen, has for its essence the effective presentation in an organism’s experience of things outside its body and sometimes external to its date of existence and to its entire physical environment as constituted at the moment of the exercise of that function.

Behaviorism, nevertheless, is a phenomenon of much interest to the historian of philosophy and of science, because it brings into perfect sharpness of definition the contrast between two modes of approach to the more general problems of science, and the consequences of one of these, when universalized. It has been the usual custom of the specialist in any of the physical sciences, as I have observed, to forget himself and keep his eye upon the object. The testimony of his senses respecting



the qualities and behavior of observable external things, and theories, conceptual constructions, suggested and in the end tested by such observations, have constituted the content of his science. And since he has not found it necessary to assume the occurrence of the cognitive phenomenon in any of the objects of his study, he has been able to ignore the fact that he himself is all the while exhibiting that phenomenon. The historically interesting and crucial thing that has been recently happening in psychology is the attempt to apply this procedure in thorough-going fashion to man himself. It was natural enough that the attempt should be made; it is, perhaps, useful that it has been made. If, as some have hoped, a comprehensive unification of knowledge on the basis suggested by the results of the more 'fundamental' natural sciences is ever to be achieved, that unification must include all the functions and processes that make up the life of the organism man. And, as a step toward that ultimate unification, it was inevitable that the experiment should be tried of bringing all human phenomena at least within the categories of ordinary biology—that is, of a biology which begins by disregarding the very fact of knowing which it exemplifies. It is the behaviorist who has performed this logical experiment for us; and the result—which might, I should have supposed, have easily been foreseen—is both conclusive and amusing. What it is I have recently pointed out elsewhere; but I may perhaps be permitted to recall the point briefly here. The behaviorist is faced by an embarrassing dilemma. He must either exclude himself and his activities as a man of science from his generalization as to that in which all animal and human activity consists; or he must include himself and his activities therein. If he excludes himself, he is admitting the occurrence in at least one organism, himself, of precisely the kind of knowing which was described at the beginning of this paper; he is claiming an acquaintance with things that are not present muscular or other movements inside his own body—for example, with his own past movements, with the muscular processes of

other organisms, with stimuli external to all organic bodies, and the like. He is, in short, admitting that there figure in his organic life entities transcendent of both the time and place of *his* existence as a physical entity. If, on the other hand, he includes himself in his generalization (as in consistency he should) he is thereby disclaiming any pretension to knowledge, and admitting that the utmost that he as an organism can at any time accomplish is to move his laryngeal or other muscles, or other portions of his anatomy, in certain so-called 'reaction-patterns.' That is doubtless an interesting exhibition; yet it hardly seems equivalent to the creation or advancement of a science.

Such are the ironic revenges which logic takes upon those men of science who begin by refusing, because of dogmatic methodological preconceptions, to look even one fact in the face—at least when that fact is the nearest at hand of all, and the one in which the conduct of scientific inquiry and the attainment of scientific conclusions themselves consist. But if the behaviorist's logical experiment is thus a complete though instructive failure, it would seem to follow that what may be called a generalized biology, and a generalized conception of the process of evolution, can be possible only upon condition that the cognitive function be fitted into its place as a biological fact, with whatever supplementation or revision of the rest of the scheme that may make necessary.

#### IV

I have time to touch upon only one other contemporary attempt to deal with the two anomalies of knowledge; and I select the most important example of an especially influential and interesting tendency of current opinion on these matters. The tendency is more largely represented among British realists of the present time than in America, though it is not without American spokesmen. My colleague Professor Knight Dunlap, a distinguished graduate of this University, holds a kindred

view, so far as the issues here under consideration are concerned. But the specific example to which I shall limit myself is the doctrine developed by Samuel Alexander in a long series of papers, chiefly in the *Proceedings* of the London Aristotelian Society, and recently systematically set forth in his *Space, Time and Deity*, one of the most considerable, ingenious, and carefully elaborated contributions to philosophy which the present century has produced.

The lesser anomaly is a good deal attenuated but not altogether abolished in Alexander's theory. Whenever knowing occurs, a 'mental event'—an event which *in a certain sense* is not physical—admittedly occurs; without this, Alexander holds, there can be no such thing as knowing. This event consists in an activity apparently peculiar to some organisms, and in its higher forms to man—called generically 'mind' or 'consciousness' or 'awareness.' It is always directed upon objects; the name of it, indeed, is not complete unless followed by the preposition 'of.' And these objects in no case owe their existence or their qualities to it. With this unique activity Alexander thinks we have an immediate or 'inner' acquaintance which he calls 'enjoyment'—a term, however, which is not to be understood as implying that all awareness is accompanied by agreeable feeling. We 'enjoy' our own consciousness, then, and—by what Alexander seems, at least at times, to regard as a radically different type of activity—we 'contemplate' objects; more precisely, consciousness itself *is* a contemplation of objects.<sup>7</sup> But the residuum of the distinctively 'psychical' thus left in Alexander's universe seems, at first sight, to be decidedly scanty. For, first, consciousness itself is declared to be "identical" with certain physiological phenomena. Since we discover, "partly by experience, partly by reflection, that a process with the dis-

<sup>7</sup> The attempt to show that there is a different activity, and a distinct relation to the entity apprehended, and not merely a different *kind* of entity, in "contemplation" and "enjoyment" appears to me wholly unsuccessful; but as Alexander attaches great importance to the distinction, it is best to use his terms in explaining his position.



tinctive quality of mind or consciousness is in the same place and time with the neural processes," we are "forced to go beyond the mere correlation of the mental with these processes, and identify them. . . . That which is experienced from the inside or enjoyed as a conscious process is, as experienced from the outside, or contemplated, a neural one." But it is not clear that this "identity" is not compatible with a very large measure of difference—though I confess that Alexander's exposition of his views on the point seems to me extraordinarily elusive. At times he goes so far in the direction of pure materialism as to suggest that "mental process may be expressible completely in physiological terms,"<sup>s</sup> though, of course, in *distinctive* physiological terms, which would not correctly describe a "non-mental" physical process. It appears, in some passages, to be suggested that what "chiefly" differentiates those neural processes which can also be named "psychical" is their "locality in the nervous system" or their high degree of physiological complexity and organization. Elsewhere the language of the identification theory is abandoned, and we are told merely that the neural process "carries thought"—which last, therefore, can hardly *be* the neural process. And Alexander expressly argues against the view of some American neo-realists that consciousness can be adequately represented merely by conceiving of "an envioning world of things provoking specific neural responses." Such a doctrine appears to him "to fail to account for a vital feature of the cognitive situation, namely, that in being aware of a fire, the fire is before *me*, it is I who see it." There is, in other words, not merely the fire and the neural response, however complex, but also "an act of consciousness" whereby the response "is something which *experiences itself*." This "experiencing of itself" would appear to be something quite distinct from what is usually understood by a neural process, viz., a particular type of molecular motion or an electro-magnetic

<sup>s</sup> *Space, Time and Deity*, II, 7.

transaction between electrons. Unfortunately Alexander fails to face this issue definitely, and his position consequently remains hard to define; he does not tell us plainly whether "consciousness," or a "mental act," is a motion of molecules (of a complex sort and in a special portion of the brain), or whether it constitutes an event of which no description of even the most complicated molecular movements could give us any true notion. The impression one gets, however, is, I think, that the author of *Space, Time and Deity*, if he should deal expressly with this question, would answer that "mental processes" are *not* merely movements of particles—that the "enjoyment" of a given neural process (viz., of the change of position of a group of particles moving at a given velocity) is not literally the same occurrence as either *that* change of position, or some other change of position of some other particles, taking place at the same time. If this interpretation is correct, there is an irreducibly non-physical element in the *process* of knowing, as conceived by Alexander, though that element is only one side of a two-sided fact: a cognitive act is, as "contemplated," truly a physical phenomenon in the nervous system, though as "enjoyed" it is not a physical phenomenon, nor in any respect similar to one. As regards the *objects* of knowing there is, happily, no such obscurity in this author's presentation of his doctrine. The objects of awareness, he tells us, are exclusively "non-mental or physical realities," "some part of the whole world of Space-Time." The act of knowing merely, so to say, illuminates what is there entirely independently of it; that which is "before the mind" is not composed, either in whole or part, of non-physical "ideas," but of a selection out of the actual content of the physical world, apprehended without mediation or representation.

Whatever be the precise measure of the non-physical element in this philosopher's world, it seems, at any rate, sufficient to exclude that "biological continuity" which I have quoted Dewey as desiderating. The evolutionary process is here conceived as

literally creative. There are sudden transformation scenes in it; new types of reality "emerge," to use a favorite word of Alexander's; and "consciousness" is, at all events on this planet, the latest of these saltatory innovations, though we have no reason to suppose that it will be the last—indeed we are offered a "speculative assurance" (on what real grounds it is difficult to see) that it cannot be the last. So far, then, as the first anomaly consisted in the implication of such biological discontinuity by the phenomenon of knowing, it still stands. The *content* of experience, the world of objects contemplated, has, indeed, been purged of everything mental or subjective; but knowing itself, at least as it is "enjoyed," apparently remains (in spite of its so-called "identification" with neural processes) a sheer external addition to that world, having no attributes, beyond presence in the same time and space, in common with its processes.

But what precisely does Alexander mean when he asserts that—for example, in the specific case of memory—consciousness is conversant exclusively with "physical realities"? What and when is the physical reality upon which memory is directed? Is it the actual past object or event? And if so, does the assertion that the object apprehended is always "physical" mean that the past object is *now* a part of the physical world? Alexander's language at times might lead one so to construe him. He observes, for example, with reference to his own view, that it doubtless "seems in the last degree paradoxical to ascribe to the image of a landscape regained in the memory—and still more to one which one has never seen—an existence, in this case physical, independent of the mind. . . . Images appear to be patently psychical, to be mere ideas and in no sense realities." Now the principal reason why memory-images have appeared to most philosophers and psychologists of previous generations to be psychical is simply that there does not seem to be room for them, at the moment of their being experienced, in a *present* physical scheme of things; and the air of paradox which to such



persons might seem to invest Alexander's conception might be due to the supposition that he declares this imaginal content to *have* a place in the present physical world. But it turns out that the adjective "physical" is used by Alexander in a temporally unbounded sense. It does not imply presence in any particular physical system synchronous with the act of knowing. The remembered object, he writes, "is physical insofar as [it] behaves according to the laws of physics." A remembered friend "does not speak now, but he is remembered as speaking, or, to vary the example, the memory object is the physical man cutting physical trees yesterday." In short, the object of my retrospective knowledge is *not* declared to be any part of my present physical environment; it is asserted to be "physical" only in the past tense. In so far as Alexander affirms the physicality of the remembered object merely in this innocuous sense, he will hardly be charged with paradox.

There is, it is true, a real and, as I think, fatal paradox in his doctrine; but it is precisely the reverse of the one suggested. It consists, not in putting the known past event or object into the present physical order, but in leaving it in all its pastness and providing no present substitute for it—in giving to the act of cognition nothing whatever that is synchronous with itself to deal with. Here, however, we pass again from the lesser to the greater anomaly of knowledge; and we must now consider some observations of Alexander's which have the look of being intended as his solution of the latter difficulty.

He often writes, namely, as if he had framed a way of conceiving of the cognitive situation which eliminates the anomaly of transcendent reference altogether. "The relation of the conscious subject to an object which transcends it," he declares, is not "unique"; it is, on the contrary, merely "an instance of the simplest and most universal of all relations," that of "compresence within one space and time." There is no mystery about the compresence of two physical things, and just as little about the compresence of a "mental process" with "some existent of

lower order." But it presently appears that "compresence" here does not mean simultaneity; it means merely the existence of two things at *any* two times and in *any* two places within the entire range of an assumed single Time-Space system. This meeting is compresent with the first meeting of the Philosophical Union which I ever attended, thirty years ago; George Washington is compresent with Mr. Harding, and the fiftieth President of the United States is compresent with both. In this large and liberal sense, undeniably, compresence can be asserted equally and univocally of all objects or events, whether mental or physical. It happens, however, that in knowledge of the past or future, there empirically occurs a compresence of quite a different sort. The relation between George Washington and my 'consciousness,' when I am thinking of him, is scarcely the same as the relation which subsists when I am thinking, not of him, but of something else; yet in both cases my 'consciousness' and the Father of his Country are equally compresent, in Alexander's sense. Nor—leaving the temporal difference aside—is my consciousness of the things in front of me, which I see, the same relation as my mere compresence with the things behind my back, which I do not see. Alexander thus finds himself constrained to recognize that "there is nothing in the relation of two material finites comparable with the situation" exemplified by genuinely cognitive consciousness, and, in particular, by the remembrance of a past experience; and only imperfect analogies with it among non-cognitive organic phenomena.<sup>9</sup> This being the case, his remarks about "compresence" seem to have no relevancy to the actual anomaly of transcendent reference.

<sup>9</sup> *Space, Time and Deity*, II, 83-84. On this point also, however, Alexander's language seems to me obscure and wavering. He manifestly desires to minimize the difficulty by "using 'knowing' in an extended sense for the relation between *any* finite and those of a lower empirical order," *i.e.*, for all cases of compresence where there is a difference of grade between the entities compresent. Thus, "just as objects [e.g. sensible qualities] are to our mind partial revelations of the thing from which the object is selected," so to an amoeba inanimate things "are revealed in their material characters," and to one inanimate thing are "revealed" the primary qualities of another. This at first sounds like panpsychism. But we are at the same

His real procedure with respect to that anomaly is, if I have understood his meaning, to accept—though not always unambiguously—one of the two horns of the dilemma in which it consists. The believers in ideas, as we have seen, have held that belief largely because it seemed to them evident that, when they thought of the past, they must necessarily have—and also, as an experienced fact, did have—in their consciousness some *present* content, which could not be considered identical with the past object, simply because of the difference of date between them. It has, in short, usually been assumed that when, to use Alexander's word, I "contemplate" something, that which is directly contemplated must exist simultaneously with the contemplation. Alexander, however—and this is his real paradox, to which I referred a moment ago—appears (in common with several other contemporaries) to reject this assumption, and to maintain that a present act of knowing may be directed immediately upon past or future objects. He writes, for example, in what seems to me his most definite passage on the subject: "The truth is that remembering and expecting do occur at the present moment, but we are not entitled therefore to declare their objects simultaneous with the present." The word "object," to be sure, is even here not wholly free from equivocality. There is a sense in which anyone who supposes us to have any knowledge of past or future at all might subscribe to the sentence just cited. But I do not suppose the statement to be intended in this truistic sense. I take it to mean—and

time told that the paramoecium reacts to stimuli "without, it would seem, the vaguest consciousness of any object." In short, in its "extended sense" the word "knowing" lacks precisely the signification which is of its essence when we speak of *our* "knowing"; we are, indeed repeatedly warned to "remember that the 'mind' of a [merely] living thing is not conscious mind, and has not the empirical character of consciousness at all." In short, as Alexander grants, the "extended use" of the term is merely a metaphor; and the things to which it is figuratively applied are avowedly without the specific characteristic which the word connotes when it is applied literally. Thus, to lend support to the proposition that "all that knowing" (*i.e.*, admittedly "conscious" knowing, or awareness) "implies is the comprehension of a mind and an object at a lower level," "knowing" is given a new meaning from which awareness is expressly excluded.



this seems the only meaning congruous with the doctrine as a whole—that when you remember, as I now invite you to do, the appearance of the Tower of Jewels at the Panama-Pacific Exposition in 1915, there occurs an act or state of being conscious, which is entirely distinct from anything that you are conscious *of*, and is an existent of the present date; but that on the side of experienced content—of that which you have before your thought—there is nothing whatever which can be said to exist at the present date, but only things existent in your past experience, and, in the chronology of the physical world, belonging to the year 1915 as reckoned in the local time-system of this planet.<sup>10</sup>

And just here, as it seems to me, we come upon the crucial issue concerning the anomalies of knowledge, and upon one of the crucial issues in contemporary philosophy. If this conception of an act of consciousness with no simultaneous content of consciousness is tenable, the greater anomaly ceases from troubling, and a long step is taken in the argument against the existence of representative ideas. Knowing, so conceived, would reach the object in all cases directly, and no intermediaries would be necessary. But is such a conception tenable? I am unable to think so. It seems to me to conflict both with the observable facts and with the logical necessities of the case. I cannot recall having myself ever enjoyed a state of cognitive consciousness in which there was nothing simultaneously before the mind. When I think of past or future events I always find myself confronted with present images. To remember, as common speech testifies, is to recall—to give present (though not physical) existence to some of the characters of a bygone item in experience. Nor can I so much as conceive how the sort of long-range yet unmediated knowing—a kind of cognitive *actio in distans*—which Alexander's theory implies, could take place. That an activity of apprehending, which of itself, it must be

<sup>10</sup> Here too, however, it is difficult to be quite sure what Alexander means; and the view mentioned should perhaps be described rather as a possible than as a certain interpretation of his position.

remembered, is entirely distinct from anything that may be apprehended, should occur at a given date and have nothing at that date, nor within that moment of experience, to apprehend—that the process of knowing should operate, as it were, *in vacuo*—is a notion to me totally unintelligible. If it is asserted that the only existent given in memory, when we think of a Philosophical Union meeting of thirty years ago, is the original meeting, that this remains fixedly in the year 1892, and that there now occurs no manner of revival or presentation of it, even of the most fragmentary sort—then the second half of this assertion appears to me expressly to deny what the first half assumes, namely, that we *are* now remembering that bygone meeting. I recognize that Alexander and others who are of his way of thinking have been driven into this paradox through the pressure of the greater anomaly of knowledge, that they have sought in this conception a way of escape from a genuine difficulty. But in no such absolute temporal sundering of the process and the content of thought or knowledge can, I think, any real escape be found.

With respect to the greater anomaly, then, we seem driven upon the horn of the dilemma alternative to the one apparently chosen by Alexander; in other words, we must conceive of all the content or material of an act of knowing as temporally present along with the act. To use one of Alexander's terms in a sense perhaps not quite his, what I *contemplate*—what is "*immediately* before the mind"—when I bethink myself of yesterday's events is not something existent yesterday, but something existent today.<sup>11</sup> But is not this horn of the dilemma, it will be asked, as impossible as the other? For what, in the case supposed, *I know about*—if there be any knowledge involved in the matter at all—is not today, but yesterday. And how

<sup>11</sup> This does not mean that, when not engaged in philosophical or psychological reflection upon the point, I necessarily think of yesterday's events as existing as today's content of consciousness. The observation that the content is in fact present, not past, arises only when the question here dealt with is raised, and is not explicit in ordinary memory-experience.

is such a knowing of things past conceivable, if the only content of present consciousness is present content? Is not the alternative proposed tantamount to a denial of the possibility of knowledge? If we were compelled to answer this question in the affirmative, our conclusion would necessarily be that the problem is insoluble—that neither of the conceivable alternatives is tenable, and that the very idea of knowledge is thus involved, for reflective thought, in an irremediable antinomy. The past or otherwise absent object of knowledge, we should be obliged to say, cannot in fact be absent, or external to the content of present consciousness; for in that case it would not now be known. But on the other hand, it *must* seemingly be absent—for it is of past or otherwise not-present objects that we are supposed to have knowledge. But in truth, I believe, we are not forced to accept so strange and disturbing a conclusion. The two sides of the seeming antinomy are not of equal logical force; one of the alternatives is meaningless, the other, though it undeniably offers some difficulties to our ordinary habits of thought, is nevertheless capable of intelligible formulation, and is, in fact, simply an accurate description of the common natural event called knowing. To speak of a present awareness of things blankly absent, of known past events that, in being known, undergo no recall or translation into the present tense, is, as we have seen, a mere self-contradiction; it is to say that one has now before one's mind something which is at the same time declared not to be now before one's mind—since it is declared to have *now* no sort of existence at all. The content or make-up (I do not speak of the causes) of a concededly present experience cannot without absurdity be described in terms of past events. But if, on the other hand, we begin our account of knowledge by recognizing the invariable and indispensable presence therein of content existentially synchronous with the act or event of knowing, we can then, I believe, find within such content all that is necessary to make knowledge of the not-present comprehensible.



For the content given in memory, or in other retrospection, or in anticipation, is not a simple, flat, one-dimensional thing. Temporal perspectives are contained within the limits even of a single 'specious present'; elements which are presented simultaneously are nevertheless also presented *as* not simultaneous, either with one another or with the present in which they are experienced. The present images without which, as I have already maintained, it is impossible to 'recall' the events of yesterday, have two dates—their date of existence in consciousness, which is today, and what may be called their date of reference, which is yesterday. But the pastness of their date of reference is itself a present quality of the memory-images. It is something which I directly experience as one of the attributes of the now given content; and I do so without performing the miraculous feat either of actually turning backward time in its flight, or of being aware of an object without having any present content of my awareness. In other words, we apprehend the various elements of our presented content as fitting into a framework of *conceptualized* temporal relations—which in fact appear in consciousness largely in the form, or by the aid, of spatial imagery, as of a calendar or a time-table. And this temporal framework in which our images appear has a curious twofold relation to our present consciousness. As a datum for psychological observation, as an existent now given in consciousness, the framework is *included in* the present moment's content; but at the same time, as a conceived scheme of relations, it logically *includes* the present moment and its content as a single unit in the larger system represented. The solution—as it appears to me—of the anomaly of the presentness of the absent in cognition lies precisely in this dual and (to use a term of Royce's) "self-representative" character of thought. A given moment of thought may consist in a representation of a whole world of objects in relations of many kinds—temporal, spatial, logical—in which it is itself, *as represented*, a mere fragment. Thus it is that a given thought, *e.g.* a memory, can, and does, cognitively

or representatively transcend itself, without any existential self-transcendence. The memory-image which I am at this moment evoking exists as a transient bit of reality now, and at no other time; but that which *does* thus exist now is a representation of a more comprehensive whole in which the now is an element consciously distinguished from the not-now. Because our thought has this obvious peculiarity, we can see how it is not only possible but necessary that an act of rational cognition should be conversant with a Beyond, while yet as a natural event it is limited in its existence to the here-and-now; we can see how it is conceivable that a bit of present content should 'mean' the past and future without *being* past or future, and how the experience or awareness of such a meaning is not any sort of removal into the past or the future.

And we can now also see precisely what is meant when it is said that the content of a cognitive experience—of memory, for example—is 'present-as-absent.' That content (the memory-image) is present in the literal sense; it is an existent contemporaneous with the event of knowing. But it is presented 'as absent' in the sense that, in the conceptual scheme of temporal relations which is also now presented, the memory content is assigned a position external and prior to that occupied in the same scheme by the present moment. And there is no contradiction in this; for the presentness and the pastness are not predicated of the same content in the same sense. The content has a date and it also includes or represents dates; and the date which it has is not necessarily the same as the dates represented. It is true that such an account of the matter implies that all knowing of things remote in time or place is indirect and substitutional. The conceptual pastness of my memory-image is not an experience of pastness; and the bygone event remembered does not itself now enter my experience. If it did it would not be what we mean by a remembered event, namely, one which has ceased before the remembering of it occurs. Pastness is

never—and from its own nature cannot be—experienced at all;<sup>12</sup>—it figures in experience only through a present peculiarity distinguishing certain present data from others. We have a meaningful idea of it, but no ‘acquaintance with’ it; and the idea means it partly because it is one of those ideas which present themselves in consciousness saying: “I stand for something not myself; the thing that I am is not the thing that I mean.” The same is, of course, true of the idea of the future; but the two are differentiated, they have distinctive *present values*, through their utterly dissimilar relations to our volitional and affective life.

There are, however, some minds which appear to have an unconquerable repugnance to such a conception of knowing as indirect. Nothing less than literal and complete possession of the object known will satisfy them. They wish to transact their cognitive business only with principals, never with deputies, however extensive the powers of attorney these may exhibit. If it is a question of dinosaurs, they would presumably insist upon meeting the original reptiles in the actual Jurassic period, before admitting that those monsters are ‘known’ at all. Such a craving for immediacy in cognition, however, is simply a rebellion against the limitations of our human powers—limitations arising chiefly from the fact that man, the knower, is himself a temporal creature, whose existence is meted out to him in successive drops persisting each but for a moment. Because his life is of such a sort, he can never enter into actual present possession even of his own past—nor of his own future, so long as futurity is intelligibly predicable of it. His knowledge, therefore, of aught that is not present, or not his own experience, is inevitably

<sup>12</sup> This is said without prejudice to the view, held by some psychologists, that in a single ‘specious present’ we directly experience a small lapsing bit of the past. For a past which is admittedly external to a given present (e.g., a remembered past) is obviously past in a very different sense from one which is supposed to be contained within a so-called present experience, and is thus somehow both present and past. It is only with pastness in the former and more rigorous sense that I am here concerned.



vicarious; the objects which he often would most wish to make fully his own—his lost youth, an expected good fortune, his fellows' thoughts and feelings—keep their distance, preserve inviolate the distinctions and reciprocal exclusions which make up the order of the world. Knowledge thus, in Santayana's admirable phrase, is a salutation, not an embrace. Instead of denying these unescapable limitations of our knowing, we do well, while recognizing them, to fix our attention upon the other half of the story. Indirect though knowledge is, it is yet a presentation, within the limits of the passing moment and the individual consciousness, of things apprehended as transcending those limits. Within the microcosm of my present thought is reflected, as in a mirror, a macrocosm of other objects and other thoughts—and they are known to *be* other simply because their images bear the marks of 'otherness' upon them. And this means nothing mysterious or 'metaphysical'; it merely names a fact of the commonest everyday experience, namely, that data which are immediately and indubitably present—which offer the conclusive evidence of present existence which consists in actual givenness in this moment of conscious life—yet carry with them familiar, though not infallible, *indicia* of pastness or of futurity or of presence in the conscious life of others.<sup>13</sup>

Such, then, I suggest, is the solution of the chief paradox of knowledge. But such a solution is obviously impossible except upon the assumption which I have throughout been making in expounding it—the assumption of the existence of representative ideas. In other words, the only available way of escape from the greater anomaly seems to require us cheerfully to accept the lesser. The content synchronous with a given act of knowing by means of which alone temporally or otherwise absent objects can be brought 'before the mind' clearly cannot be assigned to that public, coherent, measurable, ponderable world

<sup>13</sup> The question how tests of *validity* in our knowledge of not-present objects can be applied in accordance with the general view here indicated lies beyond the scope of this lecture.

of moving masses or particles with which the physical sciences have to do. And if we mean by the adjectives 'mental' or 'psychical' simply 'existing but not as a part of the simultaneously existing physical world,' then, aside from other considerations which have been intimated, the occurrence of mental entities in nature has been sufficiently demonstrated by the result of our analysis of the phenomenon of knowing.

I am well aware that the positive thesis concerning the greater anomaly which I have presented stands in need of a more elaborate formulation than it has here received, and that some difficulties may still naturally suggest themselves. So large a theme can hardly be adequately dealt with in a single hour's lecture; and I must here be content but to have sketched a way of thinking about this strange activity of ours which seems to me at least worthy of consideration, in view of the apparent failure of the other attempts to rid our knowing of the paradoxical look which it wears when we take the trouble to reflect upon it. For the rest, this discourse will have perhaps served its purpose if it has done something, first, to make a little more vivid to some of my readers, the queerness of knowing, its distinctiveness among natural processes; second, to trace some conflicting tendencies in contemporary philosophy to a common source, and, what is more, to a common and genuine difficulty in interpreting an indubitable and familiar fact of experience, and thus to render these conflicts a little more intelligible, to make it more understandable why philosophers are so; and lastly, to suggest some reasons for suspecting that funeral orations may have been pronounced prematurely over the hypothesis of representative ideas. For I will conclude by repeating the confession that, in spite of the ingenious reasonings of many contemporaries, I am still much inclined to believe that I have ideas, and that without them I and other men would know even less than we do—would, to be precise, know nothing at all.





# THE NATURE AND HABITAT OF MIND

BY  
GEORGE P. ADAMS



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Any organized body of knowledge, whether in science or in philosophy—if one may suppose for the moment that somewhere, in some philosophy there is valid knowledge—exhibits the presence of two components. There are first, diverse items, data or facts, and secondly, there is some one or more principle of selection, arrangement, and organization by virtue of which the various facts fall into some sort of system. In saying this I make no assumption as to the metaphysical or existential status of the particular facts and events which are assembled in an organized body of knowledge, or of the principles of organization and relationship which define the nature of the enveloping structure. This distinction between form and matter—for such it is ('matter' taken in the Greek and not in the modern sense)—applies equally to a thoroughgoing realism according to which the categories are supposed to be just as independent of any constructive mental processes as are the perceived facts and events of nature, and to an idealism or pragmatism which regards mind or minds as actively engaged in organizing and reorganizing the stuff of experience. Any organized assemblage of items, a crystal, an animal body, the books in one's library, statistical weather observations arranged and interpreted in a treatise on Meteorology, a metaphysical system of the universe, all these are comprised of a variety of particular facts, events, and aspects, selected and arranged in a certain way.

But there appears to be a difference between science and philosophy with respect to the relative part played by observable data on the one hand, and organizing, form-giving principles



on the other hand. These latter admit in science of a wider acceptance; they command an allegiance more universal and widespread, even if more tacit, among scientists than is the case among philosophers with respect to the formative principles which guide their selection of and their reflection upon the facts of experience. For, even in those growing and critical periods of science when rival hypotheses of wide scope and generality are contending for mastery—an emission or undulatory theory of light, a nebula or planetesimal hypothesis concerning the origin of the solar system—a decision is effected by an appeal to a body of facts recognized in common by everyone as belonging to the universe of discourse of the science in question. And within this universe of discourse there are recognized wider and more inclusive categories than those with which the specific contending theories are concerned. It is this common recognition which, in science, makes ultimate agreement possible. The continuity of events in space and time (or spaces and times), the conservation of mass and energy, stand for beliefs which are the common property of the advocates of competing hypotheses and theories in the physical sciences. But philosophers fail to agree both as to the universe of discourse within which they are to draw their facts, and also as to the commanding principles which determine or at any rate color their interpretation of these facts. Experience seems to show the extraordinary difficulty of framing a philosophical question so unambiguously that, by means of a patient and detailed analysis of some situation present to experience, a common agreement may be reached. Do the neurone fibers touch one another or are there synapses in the brain tissue, is a question that can be settled by an appeal to the facts. But the question whether sense data are physical or mental continues to be discussed because, among other things at least, philosophers cannot agree to the meaning of the terms 'physical' and 'mental,' and their disagreement arises from the conflict between fundamental organizing ideas, habits of thought, and selective interests which determine the connotation and

the denotation of the terms 'physical' and 'mental.' Every philosophy seizes upon what it supposes to be some deep and characteristic motive or idea of the universe or of experience, and it erects this motive or idea into a principle of organization and of interpretation in accordance with which large and varied tracts of experience may be seen in a single perspective. I am drawing no moral from this unless it be that, in Santayana's words, "it would be well for us, since we must be biassed and fragmentary, to cultivate as many different ways as possible of depicting the universe," or in Whitehead's injunction, "seek simplicity and distrust it." I should not think it necessary or wise to say that the strife of philosophical ideas is a mere echo of conflicting temperaments and subjective interests. It is rather a rivalry between concepts, each of which is a selective and organizing principle, chosen both because it represents a real aspect or grain of the world, and also because it makes some appeal to the philosophical imagination. Philosophy is certainly not poetry, but I do not think we are entitled to say either that it is science, or that it should aim to be quite the same sort of thing as science.

These preliminary remarks are intended to explain and to justify the plan which I shall follow in this paper. I am to discuss the nature of mind, and the kind of world in which mind lives, its habitat. If I were a zoologist, and were to undertake, say, to describe the structure of the earthworm *Allolobophora* and the nature of its habitat I should, I suppose, through diagrams and scientific description report to you concerning a specific field of facts and processes which all of you would recognize as relevant to the task in hand. But unfortunately, in describing mind and its habitat, the procedure is much less certain and direct, not so much because mind is, or is thought to be, something non-physical, but because the region of facts to which you appeal—and you can appeal to nothing else—depends upon your choice and your use of large and often vague directive and formative ideas. The behaviorist and introspec-

tionist, the realist, idealist, and pragmatist, do not report the same things about mind and its habitat because the organizing principles leading to their selection, description, and interpretation of facts are different. And if the organizing principle, the particular bias of a philosopher, is challenged he will probably appeal for its vindication to the very body of facts, the specific universe of discourse, which is defined by the principle in question, and he then wonders why other philosophers do not agree with him. Instead, then, of trying to bring before you a mind within a habitat and asking you to see what they both are, I propose first to consider a certain pregnant and directive organizing principle by means of which many philosophers believe that they can discover and articulate the nature and habitat of mind.

This principle is a formative idea which is confined to no one type of philosophical doctrine as types are commonly labeled; it cuts across otherwise quite diverse philosophical structures. The motive in question is that of envisaging reality, so far as the problem of mind is concerned, as the scene in which the life processes of organized bodies are engaged in an active commerce and intercourse with the objects and events which constitute their effective environment. What we call mind is to be defined and interpreted in terms of such a togetherness, contact, and mutual interaction of animal bodies, and the physical objects and events comprised within their physical environment. Here is an intellectual framework which, on the part of thinkers who adopt it, provides a mold in which every question concerning the nature and habitat of mind is framed, and which predetermines the outlines, at least, of an answer to such questions. There are at least three powerful motives which have contributed to the adoption of this guiding framework and principle. If, as Burnet has suggested, an alternation of the mathematical or analytic and the biological interest is characteristic of the entire development both of scientific thought and of philosophy, then it may be said that this interpretation of mind in terms of the



life processes of animal bodies interacting with their environment issues from that dominance of biological concepts which is characteristic of so much nineteenth century philosophy. But this conceptual framework appeals also to that philosophical motive which can be described as the love of continuity. For, the life processes which comprise an animal body are continuous with the rest of nature in two senses. They are parts of the same space-time continuum of which all physical objects and events are, in Alexander's phrase, specific configurations. Also, such a continuity appears to imply that animal bodies are com-present with other physical objects and events with no intervening or representative stuff of consciousness or ideas. Animal bodies are next to and immediately contiguous with environing objects and processes, themselves continuous with more distant and remote events in the space-time continuum of nature. The interpretation of knowledge in terms of immediacy, of a direct presentation of objects to the mind or body of an animal organism, or in terms of the effective and direct working over, reorganization, and control of the environment, issues from this motive of continuity.

The third motive which plays a part in the interpretation of mind in terms of the contact between animal bodies and their environment is this. Processes live in time, and time is an abstraction, as Whitehead urges, from the "passage of nature," "its development, its creative advance." The belief in the reality of time, the motive which Lovejoy has characterized negatively as "the obsolescence of the eternal," finds expression in the identification of mind with the processes which comprise an animal body in its intercourse with a nature which itself is a "passage of events." I do not mean to imply that any thinker who takes time seriously is thereby of necessity committed to an interpretation of mind in terms of the processes of animal bodies. But this motive, when joined to a biological bias and the motive of continuity, leads to the rejection of any view according to which mind is the witness to some significant whole structure,

such, for instance, as is represented by traditional idealism. These motives lead also to the rejection of any view according to which the characteristic achievement of mind is definable, not in terms of process, but in terms of essences and ideas, meanings and forms, whose locus does not lie in the passage of events.

The belief that the salient clew to the nature and habitat of mind is to be found in the active intercourse of an animal body with its natural environment is a characteristic presupposition or directive idea in diverse types of philosophical synthesis as well as of psychology. I propose to discuss three types of philosophy which give expression to this motive. All of them report that mind is to be found only where animal bodies of a sufficient degree of complexity are engaged in an active intercourse with their environment. But this well grounded observation, which no authentic experience appears to discredit, is made the basis for the further statement that the whole nature of mind is exhaustively to be defined in terms of the interaction between life processes and environing objects. The three distinct ways in which, in current discussions, such a task is essayed are these. First is the view variously called the relational theory of mind, the searchlight theory, the cross-section theory, or the perspective theory. It was first clearly formulated, I think, in James's essay "Does Consciousness Exist?" and is now identified with the writings of the Neo-Realists. The life processes of animal bodies which are here important are the specific neural responses which select out from the total environment those objects or aspects which are the effective stimuli of the organism's sense organs. The objects thus selected out by the neural responses constitute the field of consciousness, of objects perceived, imagined, and felt. A perceived object is identical with the real object in space and time, only in being perceived it enters into a new context determined by the selective neural responses of the organism. Mind becomes a name for the field of objects, events, and relations focussed in a specific perspective which is determined by these neural responses of

the body. Thus defined, mind cannot be said to inhabit an animal body. All that can be said is that the neural responses which define the field of objects identified with mind are those processes of animal bodies which are directed upon and which respond to objects. This type of theory then certainly takes its origin from the concept of life processes interacting with portions or aspects of the environment.

Alexander—I come to a second form of the process-object hypothesis, as we may call this basic, organizing idea—rejects the relational, objective theory of mind. But for him, equally with the Neo-Realists, wherever there is mind there is the intercourse or compresence of a bodily, neural process and an enviroing object. Only, what we call mind or consciousness is declared to be identical with a bodily process; it is a “process with the distinctive quality of mind or consciousness in the same place and time with a neural process, that is, with a highly differentiated and complex process of our living body.”<sup>1</sup> To be conscious is to “enjoy” these bodily processes, to experience them from the inside. The object, on the other hand, is “contemplated.” But the contemplation of the object, its being felt, perceived, or known, is itself an enjoyment. Here too, then, we have an interpretation of mind in terms of the intercourse between the life processes of complex, highly developed animal organisms and physical objects.

A third and differing type of theory, but one which works within the general limits of a process-object concept, is afforded by Pragmatism. For Dewey, mind is certainly not identified either with the field of objects selected by neural responses, nor with the acts of enjoyment which constitute the inner side of bodily processes directed upon and compresent with objects. The active, practical intercourse between the organism and its environment is the behavior or experience of the organism. What we call mind or states of consciousness “are but the cross-sections of the flow of behavior, arrested for inspection, made

<sup>1</sup> S. Alexander, *Space, Time and Deity*, II, 5.

in order that we may reconstruct experience in its life history.'"<sup>2</sup> Or, as he puts it in another place, "if it could be shown that psychology is essentially not a science of states of consciousness, but of behavior, conceived as a process of continuous readjustment, then the undoubted facts which go by the name of sensation, perception, image, emotion, concept, would be interpreted to mean peculiar (i.e., specifically qualitative) epochs, phases, crises in the scheme of behavior.'"<sup>3</sup> Thus, take the case of perception. Instead of saying that a perception is a mental event or content, and as such a moment in or a fragment of the stream of consciousness, one ought rather to say that the self, i.e., the organism is contained in the perception. A perception is a natural event, a phase of behavior, an incident in the intercourse between the organism and the environment. A perception is not presented to a self, but "the organism is involved in the occurrence of the perception in the same sort of way that hydrogen is involved in the happening—producing—of water."<sup>4</sup>

Here then are three different ways in which the nature and habitat of mind are interpreted when one thinks in terms of the active intercourse between the life processes of bodily organisms and objects in the natural environment. Mind inhabits either the objects selected by specific neural responses (Neo-Realism), or the neural responses themselves (Alexander), or the critical and problematic phases in the "flow of behavior" (Dewey). For each of these three views the habitat of mind is located somewhere in the situation defined by the intercourse between animal bodies and their physical environment, and the nature and function of mind is wholly relevant to such intercourse. Common to these three types of theory as to the nature and habitat of mind is the rejection of any belief in a specific stuff of consciousness which exists as the mind's contents or data, as the material

<sup>2</sup> Dewey, *The Influence of Darwin upon Philosophy and Other Essays*, p. 263.

<sup>3</sup> Dewey, *Essays in Experimental Logic*, p. 221.

<sup>4</sup> Dewey, *Journal of Philosophy*, VIII, 552.



which the mind has before it and with which it works. In these views the mind, identified with or inhering in the bodily organism, has before it objects selected from the physical environment of the bodily organism. Only, in Alexander's view, consciousness is a specific quale, and then only of the neural responses of the organism with which the enjoyments characteristic of consciousness are identified, and not of the objects contemplated by or present to such conscious enjoyments. For Dewey an idea stands for such objects in the behavior continuum as are the antecedents and the provocative conditions of intelligent, controlled behavior. And Neo-Realism identifies both consciousness and its contents with the total field of objects selected by the specific neural responses. Now those theories of mind according to which ideas, as something other than physical objects, play no significant rôle in defining the nature of mind, are all of them theories which issue from the directive concept of bodily life processes interacting with the physical environment; and this fact suggests that theories of mind in which ideas do play a conspicuous part take their rise from some different organizing principle. I propose now to set forth certain considerations and motives in the light of which the entire life and habitat of mind are not adequately to be described in terms of the intercourse between animal bodies and their physical environment. We shall then be in a position to formulate an alternative point of view, a different directive concept, and to weigh its comparative merits and adequacy. I shall mention several such motives, ranges of describable facts about the actual life of mind as we know it which, at the very least, set serious problems for those who interpret mind solely in terms of the *life process—physical environment concept*. Moreover, they are motives which, taken together and in their total bearing, suggest one or more different types of theory regarding the nature and habitat of mind.

The first two of these motives may be described as concerned with two aspects of a process in which the life activities of organisms come to be separated by a gap or distance from their

environing objects, and in which such a gap comes to be filled in with specific contents of consciousness, i.e., ideas. To speak thus is confessedly to use a metaphor. But the metaphorical expression of a gap or distance between the activities of the organism and the environing objects is merely a way of describing a break or pause in the continuity of life processes with the objects in the environment which such processes require for their completion and their satisfaction. Where a stimulus arising from an objective situation leads, uninterruptedly to its appropriate response, as in the case of instinctive behavior, the continuity between the organism and its world is maintained, and the entire situation appears to be describable in terms other than those of consciousness, of ideas. The origin of consciousness would appear to be coincident with some break in the continuity between organism and environment, between stimulus and response, between organic needs and activities and the fulfilment of those needs which derive from the world in which the organism lives. Consciousness appears "at those points where there is incapacity on the part of the purely physiological mechanism to cope with the demands of the surroundings."<sup>5</sup> Instead of a physiological mechanism interacting with objects immediately and directly we have, when this discontinuity and gap become sufficiently established, a self holding commerce with its world through the medium of ideas, of meanings and symbols, of scientific generalizations and theories. Between the life processes of the biological organism and the objects which impinge upon them, there comes to be inserted the region of ideas, of contents of consciousness.

We now recognize that between primitive man and nature there existed a thick veil of ideas, habits of thought woven of fancy and superstition, following a pattern different from that of our scientific thinking. Can we now describe the progress of our knowledge of nature as the result of breaking through this primitive veil of ideas, discarding any such medium, and

<sup>5</sup> Angell, *Psychology*, p. 50.

coming more and more to see nature face to face? Or, must we describe such progress as the discovery and the elaboration of a more adequate system of ideas which still intervene between us and nature, but intervene as do telescopes and microscopes, revealing deeper ranges of nature's life than would be accessible to us without them? I think that the latter alternative points to the more adequate answer, and I shall presently return to this question. But before doing so we may turn to another sort of idea, that which is involved in desire, and observe that the emergence of desire implies a similar tension and break in the continuity of organism and environment. If every conation and impulse, every want and need of the organism were immediately satisfied by some appropriate object ready at hand in the environment, desires would not come into being. Desire originates in a tension, a discrepancy, a distance between the life activities of the organism and the objects which will satisfy and fulfil these conations. The absence of the appropriate satisfaction or of the object capable of yielding satisfaction calls forth the idea of the object, and that idea fills in the gap between the organism and its world. Desires appear to live midway between two extremes. At the lower limit there is the immediacy of impulsive satisfaction, the unbroken continuity of life process and environment. There is no place here for desire because such continuity is unimpaired. At the upper limit there is the immediacy of aesthetic enjoyment and contemplation, where the mind is absorbed or identified with the object contemplated, and in this case desire is stilled through the filling in of the gap between the mind and its object. It is in the middle region between these two limits that the conscious desires and ideas of men live. And such conscious desires and ideas come to be thought of as belonging to a continuous mind or self because of this same lack of immediacy between life processes and objects. If each separate conation found its appropriate object and thereby came to immediate fruition, then each such impulse would be a separate fact, it would be born and it would die and

another take its place, but there would be no occasion for linking them all together as the desires and conations of a single self. This latter happens just because a desire, an idea, exists to which no immediate object corresponds. Objects are fragmentary and discrete over against the existence of continuous desirings and strivings. These accordingly come to stand out against a world of objects and to live their own continuous life. Similarly, on the other hand, the world of objects comes to be thought of as independent and continuous because our processes of dealing with these objects, our handling them, our perceiving, and our knowing them are in turn fragmentary and discrete. The interruptions of sleep and of death, of turning from one set of objects to another, are interruptions in our life and conscious processes, and over against this discontinuity the permanence and coherence of our world of objects stand out. From both sides then, from against the background of fragmentary and discrete objects, a world of continuous conscious processes belonging to a self, and against the background of fragmentary, discontinuous conscious processes, a permanent world of objects, do we see the existence of that gap or distance between life processes and objects which consciousness and ideas come in to fill.<sup>6</sup>

The situation thus defined which is characteristic of the life of mind in man, the distinction between the self and its world and the existence of ideas as contents of consciousness differing from objects immediately in contact with the organism, undoubtedly originates in the behavior situations with which the higher animals and notably man are confronted, and with which they are compelled to cope. Instinctive behavior precedes the emergence of mind and of ideas, but to recognize this need not blind one to whatever new and emergent qualities make their appearance once mind and ideas do come upon the scene of nature and of history. What this first consideration or motive points out is that when you approach the problem of mind wholly from the point of view of life processes interacting with

<sup>6</sup> Cf. Simmel, *Lebensanschauungen*, *passim*.



the physical objects of their environment, you will not be in a position even to recognize any such gap or distance between them because from such a point of view there can only be an immediacy of contact in the space-time continuum of the animal body and its world.

I turn to our second consideration. It has to do with the range or extent of the contact between the organism and its world. What we have metaphorically spoken of as a distance between these two makes possible a greater breadth and scope of contact. Just as the farther removed one is from an object the more can he take in in a single view, so organisms which touch nature directly and immediately, with no intervening gap, come in contact with their world only at some one focal point, some particular local object, felt or sensed in its isolation. Remove the organism to a distance (in the metaphorical sense), and permit ideas to intervene between it and its world, and the organism, though less immediately in contact with its objects, touches the world not at a focal point but over a broad surface. Ideas, which come to exist when the immediate continuity of life processes and objects is broken and which in a sense come to fill in the gap thus created, possess the capacity of spreading over a surface, of representing and being the symbols of what is not immediate. The difference between touch and vision is a difference in the area of contact between the animal body and its physical world. The area of contact in vision is enormously larger than in direct touch. At best the surface of the body could never touch any surface larger than itself, as when one is swimming under water, and felt surfaces are usually very much smaller than the total body surface. But vision, which is a distant touch, may cover an area many thousand or million times larger than the body, as when we see at night half the surface of distant suns. But the scope of vision of the mind's eye which sees through the medium not of sense organs but of ideas cannot be completely represented by any quantitative increase, however great, in the area of contact between the organ-

ism and its world. There does come with ideas a quantitative increase, as when I think or imagine the part of the room behind me together with the parts in front of me which I see, or when I think of the outlines, not of the map of Africa, but of the real continent itself. But the characteristic achievement of ideas lies elsewhere. For, it is a different dimension of objects, of nature, and of reality which becomes accessible to us through ideas from that which is increasingly revealed as touch develops into vision. When I say, then, that the area of contact between minds and their environment which ideas render possible is broader than any physical surface belonging in common to the bodily organism and the physical objects in the space-time world, I am using again a figure of speech. What ideas allow us to be in contact with,—again the figure of speech—what ideas enable us to know, are aspects, surfaces, and dimensions of our world which cannot in any physical sense impinge upon the body. I shall cite three instances. First, ideas can spread out beyond the present into the past and future, yet all that exists as far as physical efficacy is concerned at any present time is only the present. To know the past is to know the non-existent and the non-efficacious, at least that which is non-existent and non-efficacious in the sense in which such predicates are applicable to the present. To reply that since time is a reality therefore the present real moment is linked to an equally real past in the same way that, because of the reality of space, my body is linked to the distant sun which I see, is to ignore one meaning of the belief in the reality of time. If time is real, the past does not now exist as does the present. It is not unreal because true judgments about it, and false ones, can be made. But the past is no part of the physically existent present world, though the accumulations and effects of the past may be. No refinement or increase in power of any sense organ would disclose the past. If reality is envisaged solely in terms of bodily life processes interacting with a physical environment, there not only is no past in the sense in which there is always a moving present, but

what once existed and is now real as a past event could not be known to have been so. The distant in time, unlike the distant in space, and because of the very reality of time, cannot itself impinge upon any present process.

A second instance of a dimension which cannot be disclosed to any physical process, and which is revealed through ideas, is that of universals. On this point, if I read him rightly, I find myself unable to follow Alexander. That a universal is a "pattern of configuration in any existent," and that such a form or configuration, *as exemplified in any particular existent*, is a part of the object as sensed or perceived just as much as are its particular, non-categorical qualities, seem to me important and true propositions. But the form, the configuration, the universal as thus perceived, is not perceived as a universal. I as truly perceive the pattern woven into the piece of tapestry as I perceive its frayed edges. Boyle's law is woven into the pressure of a particular gas against the walls of its container just as the pattern is woven into the tapestry. The universal constitutes the form or law of the thing perceived. But while the particular thing or process, including both the configuration as particularized and the accidents of its particularization, impinge upon the body in the space-time continuum, I cannot see that the configuration, the universal as such does so. Nature let fall the apple on Newton's head, but not the law of gravitation. To envisage the configuration, the law of things, is to have access to a dimension of things which no quantitative increase in the refinement and range of sense organs, no further progress in the line of development from touch to vision, could yield. What Santayana says of the searchlight theory of the mind, in which the mind is equated with the collection of objects lighted up—*increase the area of that field as you will*—holds here as well: "to think you have composed consciousness by collecting its objects is like thinking you have created knowledge by collecting a library." The knowledge may well be in the library, but it is only the collection of books which is physically continuous

with my bodily processes. Like the past, the universal, when it is known as such and not merely sensed in its particular embodiment, belongs to a dimension different from that of existent objects in the space-time continuum. In both cases ideas, or some contents of consciousness akin to the nature of ideas, constitute the vehicle through which we have access to these dimensions of reality.

In addition to the real past which no longer exists and universals which are not coincident with the particular structures which embody them, there is a third class of entities which I find difficulty in locating in any process within the space-time continuum. I refer to meanings. The crucial question here is not whether the apprehension of meanings corresponds with or is even identical with some neural process. The meaning as conscious, i.e., the apprehension of meaning is a process, a passage of events in time, and if the process is a neural one, in space as well. But the meaning as apprehended is a structure which possesses a fixity, an immobility, which renders it unfit to be a moment of or a cross-section of a process. The sentence, "the wind is blowing the fallen leaf and the kitten is running after it," stabilizes and arrests in the world of meanings a process of lively animation and change. The meaning and also the truth of the statement is an arrested form, a "concretion in discourse," as Santayana has called it, and this arrested form inhabits neither the objective scene where wind, leaf, and kitten disport themselves, nor the conscious, verbal, or neural process of uttering the sentence or apprehending its meaning. The meaning or truth would subsist if both the objective scene and the conscious process were annihilated as indeed they are by the passage of time. James has called this the principle of "constancy in the mind's meanings." "Amid the flux of opinions and of physical things," he says, "the world of conceptions, of things intended to be thought about, stands stiff and immutable, like Plato's realm of ideas." And this "sense of sameness," he declares, "is the very keel and backbone of



our thinking." I think we can say even more than this. We have here, I believe, an instance and a witness in our conscious life of a feature of reality which is universal and pervasive, a categorical quality, which I am inclined to suspect holds out a greater promise of pointing the way to a metaphysics than any other single aspect of our world. The processes of nature, of life, of history, and of mind become concentrated in and focussed upon discrete objects, forms, structures, institutions, individuals, and meanings. I feel less sure about the relation between process and form in inorganic nature, but the view which Alexander has set forth with such persuasive power lends itself to this interpretation. Whether or not physical things are coagulations and configurations of space-time, momentary embodiments of the continuous flow of processes which destroy them as well as form them, certain it is that life processes become stabilized in discrete forms, individuals, and types. In the processes of history and of society, fixed institutions arise, civilizations, laws, and customs which in turn are destroyed by the processes which engendered them, and make place for other fixed forms. Likewise the stream of conscious processes becomes concentrated upon individual interests, meanings, and values, concretions in discourse, which once formed and apprehended are in turn discarded and replaced by new forms. The world of nature, of history, of mind is neither exclusively a world of process, of the passage of events, nor a world of eternal forms and substances. It is a world of mutual intercourse between processes and form. But there exists a fundamental discrepancy and tension between process and form because processes are continuous and dynamic while forms are discrete and immobile. The processes of nature, of life, of history, and of mind overflow and engulf the forms and individual structures which they create and which embody for a moment the life of things. And these successive discrete forms redirect and modify the ceaseless flow of process. The dialectic of nature, of history, and of mind is empirically discoverable after the event, but it is not capable

of any prior wholesale deduction because it is not prefigured in any existent totality given once for all. This would be the ground of my dissent from any metaphysical Absolutism in the fashion of Hegel, such for instance as is implied in the question which Bosanquet puts thus: "What, then, is the contradiction which drives the reality from form to form, if it is not the contrast of each with an immanent whole?"<sup>7</sup> It is not the contrast and contradiction between a fragment and a totality, but that between process and form, between continuity and discreteness, between what Alexander calls the "inherent restlessness of time," and the fixed, discrete definiteness of forms and structures, of meanings and individuals. I may have said enough merely to suggest in outline an organizing and directive idea, different from that of life processes inserted within nature's processes, different from that of the flow of organic behavior, and more apt, it seems to me, to disclose and to define the life and habitat of mind.

But there is a further consideration which bears upon the adequacy of the organizing concept of bodily processes continuous with nature's processes and, in consequence, of the three theories of mind in which that directive idea is displayed. This further consideration to which I now turn becomes more intelligible in the light of the tension and discrepancy, just noted, between continuous processes and discrete forms and structures. Ideas, we have seen, may be said, metaphorically at least, to fill in the gap which comes to exist between the life processes of animal bodies and the external world when the continuity between and the adaptation of organism to environment can no longer be maintained through the mechanism of instinct. Ideas, like sense organs, exist between the organism and its world, and they inevitably come thereby to play a double rôle and to lead a double life. They are possessions of the organism or self, instruments in the furtherance of its activities and

<sup>7</sup> Bosanquet, *The Meeting of Extremes in Contemporary Philosophy*, p. 58.

interests, and they are at the same time disclosures and symbols of external objects. Ideas are the meeting points of life processes and conations, and of the objects and events which go their own way in the environing world of nature. Ideas have their internal and their external meanings. They are moments or eddies in the stream of consciousness, and they are also the impressions and echoes of nature's objects. Pragmatism sees ideas chiefly or wholly as embedded in the flow of behavior, tools which the self uses to relieve the tension of obstructed needs and interests. Realism tends to view ideas as identical with objects, or as symbols of objects. The paradox or anomaly of knowledge lies in the demand that they shall be both these things and thereby serve two masters, that they shall be effectively present in the momentary pulse of conscious life, and also the witness to and the revelation of a world which stretches into past and future, and out into dimensions encompassing the nature of things. Ideas are those significant moments in the stream of consciousness which reveal objective meanings.

Now this consideration with respect to the status of ideas prepares us to observe a problematic situation with which any adequate theory of mind has to reckon. Any process, whether of life or of consciousness, possesses a characteristic relational structure, whether of causality or of the sheer restlessness of time. There are universal categorial qualities which belong to process as such, qualities which are perhaps deducible from the general nature of a continuum, and there are besides the biological characteristics of life processes and the psychological traits of mind processes. The life of ideas will share in the relational structure, the logic of process as such, of life processes, and of conscious processes. For ideas are certainly moments and episodes in the life history of individual streams of consciousness, of selves. But the whole story as to the sort of system, of relational structures, with which ideas are involved and into which they enter, is not thereby completely told. For ideas also reveal objective meanings. This reference to objective

meanings is so intimate and so closely woven into the nature and function of ideas as conscious entities, that we are almost justified in saying that ideas *are* meanings as well as moments in a process. Now it is to be noted that the relations subsisting between meanings and contents, forming thereby what James in the last chapter of his *Psychology* calls "ideal systems," are not the same as the relations subsisting between moments in a time process. The logic of a series of events comprising a process is not the same as the logic of a set of elements comprising an ideal system. That they are necessarily different is suggested by the fact already referred to, that processes are continuous, whereas meanings, like forms and individuals, are discrete. Consider, as an illustration, the history of mathematical ideas. The discovery of mathematical truths has been a historical process occurring in time, and effected by individual minds attached to animal bodies and carried along in the stream of social processes, in the development of civilization. Mathematical ideas are strewn along the course of history in the career of European civilization. In the same way the emergence of mathematical ideas in the life history of an individual forms a part of his biography. But mathematical ideas form not only such a time series of moments in an historical and biographical process. They are elements within a logical structure of mathematical meanings and truths, and such a structure is an objective system defined by relations other than those which any description of the course of a life process would disclose. As elements of such a system they have an intrinsic logic of their own independent of the logic or relational structure of the life and mind processes of an animal body or of a civilization living in history. And in so far as the emergence of mathematical ideas in history or in the life of an individual has been the emergence of true ideas, the course of these processes has been constrained not by the requirements and the logic of life processes, but by that of the ideal or idea system of mathematical truths.



A similar relation characterizes wide and pervasive regions of human experience in which the activities of men's minds impinge upon those structures and meanings which are the objects of our knowledge and the instruments of our practical interests. Men make tools. Their tool making originates in some vital need, some felt want which stumbles upon some object in nature which can be fashioned for human use. The object thus enters as an instrument into the process of life's activities. But the use of the tool depends not only on the need which it serves and into which it fits, but in a degree fully as great or even greater, its use depends upon the objective structure, the independent grain of the stuff and qualities which belong to the tool itself. The artisan's use of the tool is as much guided by this objective grain and texture as by his own technical skill and purposes. The tool is the meeting point of the relational structure, the logic characteristic of the practical needs of the life process which creates and uses it, and also that of the independent texture of the stuff comprising the tool. In a sense somewhat figurative to be sure, but not too remote from the facts, one may say that the tool, in so far as it is not wholly plastic, in so far as it has a nature of its own, "uses" the activities and life processes of the artisan who, as we commonly say, uses it. Language is another instance of the same generic situation. Whatever may have been the origin of speech, it comes to serve as an instrument both for fixing and elaborating our meanings, for conceptual analysis and synthesis, and for social communication. But language like everything objective, including the products of human activity and invention, once it exists, possesses a relational structure, a texture and logic, even a momentum of its own. In the use of language our thought processes in some measure always follow along and are guided by the suggestions and implications of this objective word structure of language. Here it becomes less figurative to say that when we carry on a course either of thought or of conversation it is language which uses us and which speaks in us as well

as we who use language. This would appear to be the element of truth in the view maintained from Hobbes to Dewey that speech reactions constitute the essence of all thinking.

The structures and institutions which comprise man's social environment must originally have been the outward deposit and projection of the energies residing within his nature. Custom and law, government and industry, must have sprung from man's instinctive life processes and needs. But once they exist they too, like tools and like language, possess a relational structure, a logic and a momentum of their own which is not identical with that of the processes which originally engendered them. The result is that individuals are always to some extent caught up in the machinery of social structures and carried along by the momentum not of their own nature, their own purposes and desires, but by that of the objective social institutions in which their own lives are embedded. The actions of men in history and society constitute the meeting point of the relational structure, the logic of their individual life processes and that of the social environment to which they belong.

So it is with ideas, to which we may come back. I have been making various suggestions by way of analogy in order to clarify the relation between the mind's processes whereby we apprehend meanings, and the contents or objects of our ideas, the meanings apprehended. Not only do meanings, as fixed, discrete entities not exist within the continuum of any time process; not only are meanings and universals, past and future, not located in the intercourse between the life processes of the body and that continuous passage of events which is nature. The range of meanings and truths apprehended by ideas, and the objects of men's practical and ideal interests as well, constitute systems possessing an objective structure of their own and which become increasingly disclosed in the human life of reason. These objective structures stand for dimensions of the total and real environment of men's minds; they elicit and direct the course of ideas and of practical interests which com-

prise the life of the mind. Meanings, though known by ideas, do not reside solely in the processes of consciousness. Nor can the term nature be stretched sufficiently wide to include these significant structures which are the objects and the habitat of our ideas. The last chapter of James's *Psychology* from which I have borrowed the term 'ideal system,' and whose metaphysical importance it would be hard to exaggerate, is an exposition of the contrast between the relational structure of experience, i.e., "the way in which reality exists or the way in which it comes before us," and the "order of scientific thought." This chapter supplies a commentary on the achievement of Alexander, whose central view is that the time-space continuum of nature, as it emerges into life and mind, provides the matrix, the scene and locus of all ideas and meanings, all knowledge and values. It is the thesis of James in this chapter, first, that the ideal systems of science, art, and morality are incongruent with the relational structure of reality as presented in experience, and second, that these ideal systems, these internal relations which enter the mind "by the back stairs as it were, or rather have not entered the mind at all, but got surreptitiously born in the house,"<sup>8</sup> that these ideal systems or ideas furnish a guide to the mind in its intercourse with its world. Thus, "the relations of resemblance and difference among things have nothing to do with the time and space order in which we may experience the latter." But the relation of resemblance is for James the generating principle of a rational ideal system which becomes exemplified in all our exact knowledge of nature. His conclusion is that "the mind is filled with necessary and eternal relations which it finds between certain of its ideal conceptions, and which form a determinate system, independent of the order of frequency in which experience may have associated the conception's originals in time and space."<sup>9</sup> In scientific knowledge we fling this network over outer realities. We learn to look out upon the passage

<sup>8</sup> James, *Psychology*, II, 627.

<sup>9</sup> *Ibid.*, p. 661.

of events in nature's processes through the medium of an ideal system possessing the sort of relational structure which is the fitting habitat of the mind. I quote once more from James. "Thousands of years ago," he says, "men started to cast the chaos of nature's sequences and juxtapositions into a form that might seem intelligible. Many were their ideal prototypes of rational order: teleological and aesthetic ties between things, causal and substantial bonds, as well as logical and mathematical relations. The most promising of these ideal systems at first were of course the richer ones, the sentimental ones. The baldest and least promising were the mathematical ones; but the history of the latter's application is a history of steadily advancing successes, whilst that of the sentimentally richer systems is one of relative sterility and failure."<sup>10</sup> Sterility and failure, it should be added, so far as a scientific knowledge of nature is concerned; but not wholly so if we are to recognize, as I think we must, that significant idea structures other than mathematical and scientific systems also comprise the habitat of mind as it increasingly discovers the nature of its own life and that of its world. These significant idea structures, like tools, language, and the fabric of social institutions, have a grain and logic of their own. We think them and when our minds live in them, they use us and live in us.

There is a certain ambiguity as to what it might mean to write the natural history of mind. One might begin by describing the way in which animal bodies are inserted within and surrounded by the processes of nature. Animal bodies are themselves processes and are continuous with those of nature. A natural history of mind will take its departure from the active intercourse between bodily life processes and the physical objects and events in the environment. It will observe the emergence of a situation in which this continuity between life processes and the physical environment is, in some measure, broken. It will observe a delay in the response, at first wholly physiological

<sup>10</sup> James, *Psychology*, II, 665.



and instinctive, to the stimuli which surrounding objects afford. This pause in the flow of behavior brings it about that the object impinging upon the animal's body at some sense organ is not merely an isolated physical object, but a sign of other and distant physical objects. It is perceived and it acquires a meaning. The organism comes to be inserted into nature's processes not only at a thin momentary point, but to touch nature over a surface, broader than the present moment. Memory and anticipation build up and add to the area of that contact. Ideas come to intervene between bodily life processes and the environment, and the career of mind is started on its way. But only started. For, the natural history of mind will record the emergence, gradual, natural but momentous, of an environment different from that of physical objects. Man has a history; he lives in a social environment, and animals do not. By this is meant something more than that man lives in the presence of other animal bodies like his own, recognizing them as his fellows, herding, fighting, and coöperating with them. Dogs and buffaloes do as much. The world in which man lives is full of the accumulated deposits of his social heritage, felt and known as such. It is in the intercourse of man with this social heritage and environment that interests, sentiments, beliefs, and loyalties are generated, just as perceptions arise through the intercourse of animal bodies and physical objects. The history of mind will observe and record the give and take, the mutual interdependence of these interests, beliefs, and sentiments, and the objective fabric of his social order and the processes of history. It will observe the energies of human nature taking on objective shape in customs and laws, political and economic institutions, and these in turn reacting back upon human nature, eliciting some of men's energies and providing no outlet for others. But a new chapter in the history of the mind opens when idea systems, which at first and for long are simply the means of intercourse between the individual and his social world, tied down to the social structures which have engendered them, become released from

their social origins and begin to go their own way, determined by the inherent logic of significant thought structures. The life of reason and imagination, of science and art begin their career. These idea systems, generated by language and social coöperation, invade morality and religion, they generate ideals of political and economic organization and, in scientific knowledge, they provide that medium of mathematical and logical thought structures through which men come to look out upon nature. So that the history of mind will have to record not only the emergence and the continuous support of the mind's processes in the processes of nature and of life, but the career and the logic of these idea systems, these significant structures in which the life of the mind is displayed.

There is thus a double meaning which attaches to the phrase 'the habitat of mind.' Our minds are, as existences, processes which are rooted in the life processes of animal bodies. In this sense our minds inhabit animal bodies. Now the processes of nature may be said to live in the time-space matrix or continuum which sustains them. But in another sense nature's processes live in the physical forms and structures which these continuous processes generate and destroy. The processes of life also in one sense live amidst the physical energies of nature, the chemical compounds which make life possible. In another no less real sense the processes of life live in the individual forms of plants and animals which comprise a discrete series of individuals thrown off and left behind by the onward sweep of life's processes. Just so, the processes of history and of society live within the environing world of nature, seashore and mountain, climate and race, but they too live in the concrete social structures and institutions in which the energies of history and of society take on individual form. Our minds live in our bodies in the same way that life processes live in the chemical compounds and physical energies which sustain them, and in the same way that the processes of history live in the natural environment which provides the background of history. But our

minds live also in the objects and forms which we think and know, enjoy and love, in the interests and values to which our sentiments and loyalties are attached. Our minds live in the significant idea systems in which the life of mind is displayed, just as life processes live in individual forms, and the processes of history in social structures.

If now we mean by the habitat of mind the system of energies and structures which have engendered and which sustain mind, then we shall say that mind inhabits animal bodies of a certain degree of complexity in their active intercourse with their environment. We shall have in the same sense to say also that minds inhabit the processes of history and of society. These too contribute to the formation of the mind. But if we mean by the habitat of the mind, as we well may, the structures and objects in which the mind's processes eventuate, the forms in which the process becomes displayed, then we will say that the mind inhabits the significant objects to which it is attached through knowledge, interest, and appreciation, and that these significant structures comprise the habitat of mind.





THE PRESENT STATUS OF  
THE THEORY OF VALUE

BY  
DAVID W. PRALL



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An adequate account of current philosophical theory of value is more than could very well be given in a short paper. Accordingly I have limited myself to what I think the three most important types of value theory. As representing the contemporary idealistic tendency I have used mainly Sorley's book, *Moral Values and the Idea of God*, and Windelband's *Introduction to Philosophy* in the English translation of 1921; as representing the pragmatic tendency, a recent article of Dewey's, and as representing the realistic tendency, the relevant chapters from Alexander's *Space, Time and Deity*. The idealistic theory seems to me not particularly important, and Dewey's contribution involves a typical pragmatic confusion. But Alexander's theory of truth, with some modifications, seems to me to throw a great deal of light on the subject of value just at that point where it is most difficult for realistic theory to exhibit its adequacy. I shall risk some concluding suggestions as to the significance for thought in general of even the tentative clarifications that present theory of value has to offer.

Sorley's contention appears to be that moral and esthetic values have validity in the sense in which propositions have validity, that values thus somehow involve judgment, or as he puts it still more vaguely, "morality begins with judgments."<sup>1</sup>

<sup>1</sup> *Op. cit.* (ed. 2), p. 69.

Thus morality is not subjective, and the validity of a moral judgment is to be tested by a method parallel to that in which we attempt to validate propositions in science. The criterion of value is, he finds, independent of particular minds; and moral value itself, accruing to actions from the ground on which they are *correctly* judged to be right, must be constituted in a region beyond that of empirically good acts or of the empirically tested judgments concerning this goodness. It is from the possibility of error in moral judgments that we argue to the fact that moral worth resides somewhere outside the sphere of empirical experience. As Windelband puts it more generally, "the philosophic standpoint is that of an appreciation of values of universal validity."<sup>2</sup> "Truth and beauty prove to be the higher values, which transcend the specifically human in a pronounced and obvious manner."<sup>3</sup> But also in the province of ethics these "higher manifestations" "have to be detected as the ultimate foundation."<sup>4</sup> And in the end "it seems necessary to pass beyond the historical manifestations of the entire human mind to some *normal* consciousness, for which these values are values."<sup>5</sup> We have to seek value-in-itself "in order to get beyond the relativity of actual appreciations; and since there is value only in relation to a valuing consciousness, the value-in-itself points to the same normal consciousness which haunts the theory of knowledge."<sup>6</sup> "Our conviction that for human valuation there are absolute norms . . . is based upon the assumption that here also we have the sovereignty of a transcendent rational order."<sup>7</sup>

While Sorley confines himself principally to moral values, his arguments involve a general theory; and it is just the parallel between truth and goodness that for him helps to establish the absoluteness and transcendence of what Windelband calls the norms of valuation. While the learning of the book is not to be questioned, the fact remains that if we take the central thesis

<sup>2</sup> *Op. cit.*, p. 270.

<sup>5</sup> *Ibid.*, pp. 215-216.

<sup>3</sup> *Ibid.*, p. 303.

<sup>6</sup> *Ibid.*, p. 216.

<sup>4</sup> *Ibid.*

<sup>7</sup> *Ibid.*



seriously we can hardly be expected to consider it even made explicit, much less demonstrated. The metaphysical problem of the book is raised, Sorley says, by the question of the validity of the demand made upon the universe by a faith in the conservation of value. It is the demand of this faith that raises an inquiry into the relation of value to reality. But it is easy to show that this relation is not given nor even specifically indicated; for what we finally learn is that "wherever there is intrinsic worth in the world, there also . . . we may see a manifestation of the divine. God must therefore be conceived as the final home of values, the Supreme Worth."<sup>8</sup> But Sorley has not been able, he says, to take into account the facts of the religious consciousness; and he also says that without these facts philosophy can not undertake to solve the problem as to how "the moral purpose of the Universe" "will attain actual fulfilment in . . . finite minds."<sup>9</sup> But it is just this that we must be told if it is to become clear to us how, or even *that*, the validity of the judgments of finite minds depends upon a transcendent mind; how, in other words, human values, either as truth or as goodness, are constituted. For these human values are such, on this theory, by virtue of a transcendent validity, and this sort of transcendence puts the validity of the values, that which Sorley finds to be their real valuableness, their value-in-itself, beyond our comprehension.

Thus the elaborate argument ends with statements which make it entirely useless. The "home of all values," "the Supreme Worth," may very well be the theistic conception of God, as Sorley asserts that it is; but the sense in which God is our home is a difficult one, and until we reach home in this particularly difficult sense of the term our problems of value are no clearer. This is, I think, what Santayana calls solemnity in philosophy, where we ask seriousness. It comes under Dewey's criticism of the sort of propaganda, believed by those who teach it, which is really only the "persistence of traditional

<sup>8</sup> *Op. cit.*, p. 467.

<sup>9</sup> *Ibid.*, p. 466.

material." "It consists"—to turn Dewey's words to our present purpose—"in a systematic, almost deliberate avoidance of the spirit of criticism."<sup>10</sup> But I should not so briefly dispose of Sorley's long argument were it not that I have in another place<sup>11</sup> carefully considered the still more elaborate and tortuous arguments of Bosanquet, which tend in the same direction, and that Picard in his book, *Values, Immediate and Contributory*, has, as I think, completely exposed the weakness of Windelband's arguments, which purport to establish absolute norms. Morris Cohen says that Sorley's book illustrates one of the ways in which philosophy hopes to serve us, that is, by adhering to its medieval function as an apology for the accepted religion. "But," as he continues, "from a purely logical point of view, Sorley's argument would appear ridiculously inconclusive. Through such intellectual structures the winds of doubt blow like the autumn winds through leafless forests."<sup>12</sup>

If Sorley's idealistic arguments are gaunt and spectral as leafless northern forests, Dewey's pragmatic ones are like the rich leaf mold of a northern spring, teeming with seminal life. Dewey's theories are in general richer in matter than in form; and since philosophy is mainly successful only as it gives definition and form to ideas, I do not find Dewey's theory of value a successful philosophical speculation. It is, however, representative of a popular contemporary school of thought, and as such it demands our attention.

In the first place, Dewey says that there appear to be two meanings of the word *value*, the first of which is the ordinary sense in which we say, for example, that a course of study was valuable, or that an act was good, that Socrates was a great man, or that the hanging gardens of Babylon were beautiful. This I should maintain to be value in its primary, not to say single, meaning. But in this sense the word has little interest

<sup>10</sup> *New Republic*, XXXII, p. 140 (Oct. 4, 1922).

<sup>11</sup> *A Study in the Theory of Value*, Univ. Calif. Publ. Philos., III, pp. 170-290.

<sup>12</sup> *New Republic* XXXII, p. 8 (Sept. 27, 1922).

for Dewey. For he insists that it is only the present as leading to the future that is humanly interesting, and that the recordings of the past are of comparatively little importance. Perhaps they are of no importance at all if the future is absolutely unrelated to the past. But if there is continuity in time, and the future is what grows out of the past through the present, then what was valuable in the past is still interesting in its own past nature, and as so recorded, for just the reason that the dead records of the past, if they are correct records of the past as past, may be revived to throw light on the future. While Dewey has admitted that there is this sort of value that past valuable things illustrate, what he finds important and interesting is value in a second sense of the word, a value which is quite differently constituted, and which is created in what he calls the logical process of valuation.

We must notice what this process is, in what sense it is logical, and how it is supposed by Dewey to constitute values of specific kinds. This constituting of values, however, does not mean forming the structure of any entity called a value; rather it is the "enstating" of a value, or, to use a more ordinary term, the constituting is a causally connected process which as its effect *produces* value. Dewey is insisting here that the genesis of value is somehow also the nature of value, or that one particular part of the genesis of value is the character or quality or structure of value itself. And since this genesis is also a logical process, this amounts to saying, that in some sense and to some degree the future values of a rational being are inferred, "synthetically deduced" from his history, as it has been put by Windelband, instead of being determined by the events of that history, in the way in which any effect is said to follow from its causes. This is why the mere descriptions of the dead past are of only secondary interest, for Dewey seems to be suggesting a method by which in a logical process we reason *to* values. This is what Hume failed to see, I suppose, when he analyzed the notion of cause, and came to his famous con-

clusion that we get knowledge of matters of fact only as probable, and that this is so partly because we cannot ever by reason anticipate experience. Hume thought that to know the results of the collision of moving bodies we need to observe bodies collide. Dewey finds that in the case of values at least, this is not necessarily so. To bring the past to bear upon the future, what we should use, or perhaps what we *do* use, is a genuinely logical continuous process, without which we should revert to mere trial and error and give up rational procedure.

My hypothesis is [he says] that, after we have employed to the full judgments about given values together with such rules or generals as may be logically derived from them, there still remains a logical residuum incapable of such analysis, and demanding a judgment of a different sort. When we do not know what we like or what to like, the aid given by enumerating and classifying past likings is not always enough to settle the case. . . . My view is we may also have recourse to judgment, to reflection, to rational inquiry.<sup>13</sup>

Now it is a very special sort of rational inquiry or logical process to which Dewey has recourse. But if it is logical at all, it seems to me that he is actually giving up what Hume so emphatically asserted as "a general proposition, which admits of no exception, that the knowledge of this relation [i.e., the cause and effect relation] is not, in any instance, attained by reasonings *a priori*; but arises entirely from experience,"<sup>14</sup> *past* experience, we might add. Once more, to quote Dewey himself: "To say that judgments inevitably condition subsequent impressions, . . . is to leave the door open for at least one class of judgments *whose express content* is the conditioning effected in later values,"<sup>15</sup> "Why not then make just this conditioning . . . an object of consideration? Since some judgments are admitted to have this function, why not form still other judgments with express view to its most effective

<sup>13</sup> "Valuation and Experimental Knowledge," *Philosophical Review*, XXXI, no. 4, p. 333.

<sup>14</sup> Hume, *Enquiry Concerning Human Understanding*, Sec. IV, pt. 1.

<sup>15</sup> Dewey, *op. cit.*, p. 331.

<sup>16</sup> *Ibid.*, pp. 331-332.



exercise?"<sup>16</sup> The answer to me seems very clear: "why not, indeed?" But we have here the express admission that the judgments so passed for the conditioning of future values are causal antecedents of valuings. Valuation may very well be a special process of this sort, a name for consciously determining ourselves to like one thing or another, as we decide that it is best to learn Greek in order to enjoy the Greek Anthology. What is objectionable is the supposition that causing things, whether they be future states of mind or of body or of any other part of the world that we can be said to cause, is the nature or character or quality of the thing caused.

As no amount of exercise actually constitutes the health it may induce, as abstention from sweets and starches is not the desired slenderness, as fertilizer is not as such the fragrance of the rose whose growth it has induced, so in general the causes of things are not the characters of those things; our anthropoid ancestors were not Man, and human values are not those judgments which causally condition them.

This is one of the commonest confusions in the theory of value, and before we turn our attention to Dewey's theory in any further detail, we may stop to clear it up once for all. As, in the nature of the case, conditioning judgments cannot be the values that they condition, so also later judgments, conditioned *by* valuings or values, must fail to be the values that condition them. If value is constituted in a relation between a mind and an object toward which the mind bears a specific sort of non-cognitive, or predominantly non-cognitive attitude, which we may loosely call liking, then no posterior judgment *about* that liking is what constitutes the value. No one doubts, I suppose, that the processes of mind, its perceptions and cognitions, its feelings and its intentions, condition each other in manifold ways; but this is surely no adequate reason for saying that emotions are perceptions or that liking is knowing. The objection to an analysis that insists on keeping clear the separations that it has accomplished is an objection to all analysis; and

one must either, with Bradley, repudiate "the separation of anything from anything else," as he expressly does, or admit such separations in thought as are in themselves clear, providing that they serve to clarify and so render intelligible the situation to which the analysis is applied. The separation demanded for making value intelligible is a separation in thought of motor-affective attitude from cognitive judgment, and the fact that the two may be present at one time, or that they may mutually condition each other, is only the greater reason for keeping them distinct in our minds. Value is precisely the term applied in common usage to objects which stand at the outer end of a relation called *liking*, the inner end of which is a human mind that likes. And liking is in its primary nature, as an existing response in an actual organism, a process of mind or an attitude of mind clearly distinguishable from that process or attitude called *judgment*.

If there are various ways of liking, various ways in which minds and their objects can be related in this sort of response, then these ways define the types or kinds of *valuings* and the kinds of value. But the classification must be of the varieties of this particular species of relation; it will not serve to classify values if it be merely a classification of the various types of judgment which condition values. That would be rather in the direction of classifying roses according to the soils which produce them—a possible classification, but not so directly relevant to a knowledge of the structure or nature of roses themselves as even the classifications which the seed stores give us, *small yellow*, *large red*, etc. The classification according to fertilizer or soil would no doubt be of value to a gardener, but not to a botanist as such. And, much as Dewey prizes science and its methods, he seems in this case to be rather the grower of plants than the scientific botanist; in the realm of values, rather the reforming educator than the philosophical observer.

Such a new classification of values<sup>17</sup> is the basis of his latest addition to pragmatic value theory. With this prejudiced introduction we shall now outline it. In case I have not made myself perfectly clear already, I might remark that it seems to me an irrelevant classification; to revert to one of my illustrations, a classification of fertilizers used instead of fragrances enjoyed.

"Value has six significations," says Dewey. "First, immediate good in its immediacy or isolation—largely an intellectual abstraction for any grown up person." "Second, the same for a utility, or useful, contributory good."<sup>18</sup> This first distinction is simply that between the good in itself and that which is good for something. It is clear enough that the second in some way depends on the first. And it seems to me that what it depends on the first for is just the element of value in it. What is good for something is not really good at all unless the something is itself good. If war were only good for killing good men, it would not be good at all, but entirely bad. In so far as a means to an end has value only as means, and not directly in itself—because, for example, we mistake it for an end, and find it immediately valuable (that is, put it under Dewey's first signification of value)—in so far as it really is valuable as means, it derives the valuableness that it has from our valuing the end it serves. We may not enjoy having our teeth filled, even properly filled; but we enjoy having properly filled teeth. We pay a dentist to perform the unpleasant operation of filling them, and we value this unpleasant operation—not in itself, but as a means. It has no value to us except as it *is* a means, and if the process does not produce the satisfactory result, the process is actually not of any value. Thus, while it is a very convenient distinction to make, this between means and ends, so far as value goes there is no distinction established. The very value of the means resides in the value of the end it produces,

<sup>17</sup> What, at least *appears* to me to be a classification, although Dewey may not think of it as such.

<sup>18</sup> *Op. cit.*, p. 329.

and this end is always, if it is valuable, a situation in which some one directly likes something. It is in this liking relation that value occurs.

So much for Dewey's first pair of significations. The value signified in them is of one sort, not of two. Extrinsic value gets its value-content out of intrinsic value. The value of means as means lies entirely in the value of the ends that they serve to produce; nothing is useful unless there is something good, and the value element in the useful is identically the value of the good which it is useful in realizing, an immediate intrinsic value.

Dewey's third sort of value is "a good taken or found as such in consequence of judgment."<sup>19</sup> But plainly an antecedent judgment is not the good taken or found in consequence of this judgment. I should suppose that very few goods are found except as in part a consequence of judgment, for it is clear that our likes change as we grow up, and that part of this growing-up is judging. Any but a hypothetical first stage of finding things good is determined in part by earlier judgment; for goods are always found as good by minds at particular stages of their development, and the development consists at least partly in judging itself. But this does not serve to distinguish any one sort of goods found, that is values, from any other sort. All values are alike in being consequences of judgment in this sense, and the classification refuses to make the third sort of value distinct from other sorts. The fourth sort is, like the third, found in consequence of judgment, but found as contributory and not as immediately good. It thus pairs with the third as the second did with the first—in a relation of identity, that is, so far as it is value at all.

The fifth sort is differentiated from the preceding pair, specifically from the third sort, by a peculiarly pragmatic criterion. The third was good, found as such in consequence of judgment; the fifth is found in just this way, but it must have

<sup>19</sup> *Op. cit.*, p. 329.



further "as a characteristic part of its quality the fruits of prior judgment."<sup>20</sup> The sixth is a *utility* of this sort, and Dewey himself says that these two meanings tend to coincide in existence. But again the distinction of the pair from other sorts of value is not based on a difference in value itself. They both have as distinctive quality the fruits of prior judgment; but to call a quality a fruit of prior judgment does not distinguish that quality as such. My quality or my character is no doubt the fruit of my antecedents; but while knowledge of my particular forbears may furnish a clue to my character, the mere fact that I am a fruit of human antecedents does not help to define the nature of character as such or to give the types of character. Part of my character is also the fruit of oatmeal. All characters are the fruit of antecedents of various sorts; they may be said to have as part of their quality this being the fruit of their antecedents. So with values; they are all in part, but never wholly, the consequences of judgments, and the qualities and characters of values are thus the fruits of judgment; judgment determines them. But since this is true of the nature of all values, it will not serve as a criterion of the fifth and sixth sorts that Dewey makes out. The distinction between those sorts themselves is the same as that between the first and second, and between the third and fourth. As far as value is concerned, it falls down altogether; for this relation, as I have already shown, is identity. Thus Dewey's six varieties reduce as value to one, and all that they tell us about this one is that usually part of its cause is the activity called judging.

Still a further sort of value is indicated by Dewey in a footnote, but as I have tried to show in another place this is not value at all.<sup>21</sup> It may very well appear that I have disposed of the basis of Dewey's theory of value much too easily; and it is perhaps worth while offering my explanation of this fact, the fact, that is, that Dewey's arguments, at least as stated in his

<sup>20</sup> *Op. cit.*, p. 329.

<sup>21</sup> *The Journal of Philosophy*, XX, no. 5, pp. 128 ff.

writing, are often so easy to meet, while his thinking itself has been so great an influence, and often seems so very significant. It is that Dewey is so deeply interested in what goes on, and that what goes on is so far from being clear, that clarity in the account of anything appears to him suspicious if not false. He sees the difficult and passionate strugglings of inadequate human minds in a world of chaotic events; he himself experiences these passionate struggles. Values are the name for what all this struggling would go to establish; and Dewey cannot feel that value, that which all this tremendous turmoil is about, is adequately treated in a theory which ends by making even the definition of value clear and intelligible. He wants a philosophy of value to be a concrete description of all the processes of the mind that does the valuing. And in his eagerness to be adequate to a confusing, not to say overwhelming situation, he appears to me to have introduced an overwhelming confusion into his description of the kinds of value; a description more adequate in its emotional tone to such vital and moving issues as the phenomena of value present, but one which as logical classification seems to me *less* adequate.

This point as to the adequacy of logical classification raises the issue of truth in general, and makes particularly appropriate the discussion of truth as value. It is this question as treated by another type of value theory which we are now to consider. It may very well be held that philosophy fails to perform its function in so far as it does not clarify the situations that it analyses. It must not deny or deprecate the confusion of the concrete life of minds in a world of moving events; but it should end by offering concepts, definitions, principles, by which some order may be discerned in the apparent chaos. Such giving of intelligible form to the matter of experience is just what we mean by the discovery of truth; truth is invented as much as it is discovered. Truth is a human way of being satisfactorily and consciously related in and to nature. It is the satisfaction of a human want; it is a human value, and, so far as we can very well say, *only*

a human value, a humanly intelligible way of seeing the world, a human view of things. But it is also, I should think, the one intelligible human view. If truth is one at all, it is because there is only this one more or less detectable view acceptable to human minds as such, satisfying that sort of a thing in nature that any human mind is.

This is an assertion of the relativity of truth in the sense of dependence on minds. That is to say, we have truth so far as nature fits our modes of perception and our ways of thought. And since fitting is a symmetrical relation, it may also be said that we have truth so far as our modes of perception and our ways of thought fit nature. Indeed, as we are parts of nature, we shall expect to fit and be fitted in one way or another. Truth names a certain fitness of that which we express in statements; and a fitness in what statements express is exactly our human predilection, a fundamental human liking. But if this liking, this specific way of liking and of being liked—for of course there are two ends of this relation—if this relation of fitness in or of fitting into nature is truth, what is the object liked in such a liking? and how specifically does our mind become amalgamated (to use Alexander's word) with the objects of its knowledge, so that the description of this amalgamation describes on the one hand what we recognize as the meaning of the word *truth*, and on the other a value situation such as I have previously suggested, a situation, that is, in which there is a mind to do the liking, and thus a motor-affective subject-object relation such as, in the case of ethical and esthetic values, is so easy to indicate? And how does this type of amalgamation differ from the other sorts of conscious amalgamation which constitute these other kinds of value?

It is here that the crux of a relational theory of value comes. It is easy to make out a plausible case for ethical and esthetic values; in some sense it seems fairly intelligible that what we like in disinterested contemplation is the beautiful, and that the goodness of acts is constituted by our attitude toward them.

The validity of judgment, however, seems to transcend mere human likes. At any rate, most of the criticisms of a value theory of this sort are based on an analysis which indicates that validity in the sense in which it is used to distinguish true judgments from false also applies to all value-judgments, and that this is sufficient evidence that all values are validated by something more final than human likings. And by value-judgments here I mean simply judgments illustrated in such assertions as that a teething-ring is useful, or an infant good, or its mother beautiful, mere recordings of values experienced. It is this question of the validity of all types of value that leads idealists to their super-realm of norms or their superhuman eternal realities of other sorts; and it is this question of validity that in general accounts for the confusion of valuings with judging. Idealism is likely to turn value into reality itself instead of defining its particular place in reality, and pragmatism gives to value the same experimental nature that it gives to truth.

If then a case can be made out for truth as a value of the relational sort, neither independent of mind, on the one hand, as the realist's reality is, nor yet the product of an eternal absolute mind, who is thus the guarantor of its validity, the hardest task of such a theory is accomplished. It is this task that Alexander has performed, although this conception of truth as value was suggested and discussed before Alexander's Gifford lectures were published. The rest of this paper, however, will be little more than an exposition of the notion of truth as given in the second volume of *Space, Time and Deity*; omitting, I should add, the part which, even in Alexander's theory, judgment plays in value. After this exposition, and in conclusion, I wish, as I have said, to notice the present crying needs of value theory, that is, its most dubious contentions; and secondly, some of the crying needs *for* value theory in other branches of thinking.

But now to present this notion of truth as a human value—constituted, that is, in a relation between minds and other



objects in nature. What is this relation? and how can it even plausibly be called a form of liking? Let us suppose that mind is a certain set of bodily activities, relating our body to other objects in nature, a set of activities with which we ourselves are identical, and which, instead of merely contemplating from without, we enjoy from within, our consciousness in its specific nature being exactly the enjoyment of this activity of contemplating. That this is really the case seems to me highly probable; but it is not more, of course, than an empirical conclusion or guess. When we find a specific sort of functioning called being conscious in connection with a specific sort of structure called a nervous system, and can discern such functioning in no other connection, it seems to me no more unwarranted to speak of this functioning as a quality of this type of organism than to speak of coolness as a quality of water or redness as the color of a cherry.

But, whether you like this suggestion or not, it is clearly the case that somehow minds have experience of nature—nature being the word for what minds have experience of; and it is apparently, at least, in nature that minds occur. Minds may then fairly be said to be with other things, to be conscious of other things; and the question is as to where and when and how truth occurs as a characteristic form of this relation, in which minds find themselves contemplating other things, and enjoying this activity. To be brief and clear at the expense of fulness of meaning, let us say at once that truth is the acceptable form of this relation; it is the unique character that the relation must have in order that minds shall enter into it with satisfaction.

When we have experience which is satisfactory just as experience, we call it true. The most painful experiences satisfy this demand as well as the pleasantest. That our friends are absent, or our fathers dead, that our country is aimlessly energetic and expansive and that our universities follow suit, are not pleasant propositions; but the assertion of them may conceivably satisfy our desire for fitness in our statements. Such statements may

very well be coherent expressions of relations between minds and nature and of relations among these relations. They may very well be the truth. In fact, if they do express such relations we actually prefer them—or can be brought to prefer them—to the kind of statement that Coué has us make about our daily improvement. But certain sorts of experience are not satisfactory even as experience, as constituting experience, that is; they refuse to fit into the one space and the one time that we insist on having. Dreams as renderings of the real world are unsatisfactory, until at least they are interpreted and brought into that world. This is admitting that the test of truth is coherence; but what must cohere in truth are all our relations in and to nature. And since these are relations in fact, relations between one content and another of nature itself—between minds, that is, and other natural objects—truth follows not only upon the nature of mind but also upon the nature of reality. Being a coherence within reality—for minds themselves are there of course—it is governed by reality; being on the other hand a coherence in the relations between one particular type of real, that is, mind, as viewed by that particular type, it may certainly with reason be called the satisfaction with, or the liking of that particular sort of real for the rest. To be conscious means to fit into nature; for consciousness occurs in nature as a natural phenomenon, as wind does, or rocks or music; but to be conscious is also to fit consciously, and truthful statements are linguistic or other renderings of this fitting.

How faithful any of our conscious imagery is to reality, or any of our symbolism or any of our sense-perception, I see no way of knowing. If we draw our world to a human scale, as Santayana suggests, that is at least not necessarily misrepresentation. Our own world as known fits together and includes us as special intricate pieces; and being one of the real parts, while it prevents our being the others, still places us and our consciousness in nature. But it is thus clear that truth is the satisfaction of our perhaps instinctive and partly unconscious

desire to make our own conscious relations to the world fit. Our actual relations, as unconscious or subconscious, as simply spatio-temporal, are just there, independent of our knowledge of them. But when we speak of truth we mean not primarily this reality, but the relational fitting together of reality so that it makes a consistent whole with our conscious minds. Truth is true so far as it will fit for consciousness and no farther. What complicates the problem is that we are likely to think of truth as belonging to statements, and merely referring, in some usually very difficult sense, to something beyond. We should instead think of truth as belonging to relations between conscious mind and other parts of nature. When we make this revision we notice that this sort of relation is determined partly by conscious activity; it is in fact to be defined as the satisfaction of our liking for coherence in our consciousness of events. And this does not make truth an idiosyncrasy, even a pervasive human idiosyncrasy. For obviously the origin of our liking, inexplicable to us because coming out of the irrational matrix of instincts or impulses or unconscious dispositions to respond, but being part of our own nature, is also part of nature in the large, where we have our being. Thus the desire for coherence is itself due to nature, and we may suppose that it is an expression of a fundamental trait, of a genuine unity even. But this is beyond the immediate discussion. What I am trying to make clear is that truth is a human value without being an arbitrary construction.

Propositions are true in so far as they are those consciously felt relations to nature which fit with mind's other relations to nature, and thus fulfill mind's desire to fit its whole self consciously into the existing world of space-time of which in its primary existence and on its lower levels it is an unconscious part. There is no truth except there be minds, and minds are parts of nature so functioning as to demand that their own conscious life be seen or felt or known to them as part of the reality in which they consciously dwell, as part of the real world,

their own special fitness to share in which is more or less due to their ability to satisfy this felt demand for fitting and making things fit.

If truth can thus be said to occur in a relation which is the satisfaction of the demand of minds for coherence in experience, it is a value in the sense in which I should define the term. Value arises in a situation where there is a relation between a mind and its object, which is constituted by the attitude of the mind toward the object. The object fulfills the demand made; it suits the mind, it is liked. Truth is our most general form of human liking. What will not fit we call false. And we are right; for truth occurs in relations among real things, and the mere fact that our mind is one of these derogates in no way from the reality of truth itself. But on the other hand the truth of a proposition is not its reality; it is a further reality supervening only when conscious mind is one term in a relation called contemplating. Truth follows and is governed by the reality contemplated, but its own reality is distinct from this primary reality. Truth is what the mind as mind loves and will accept as its legitimate fare or content.

But men of mind do more than stand in relation to nature, accepting what satisfies their demand for coherence in experience. They also have other interests. Some parts or arrangements in nature suit these interests better than others. Thus arise other types of value. What satisfies in sensuous perception is esthetically valuable; what satisfies as conducive to the good life in general has moral value. Moral value is thus use-value, means rather than end. What James calls the consequential fruits are simply good in themselves, satisfactory rather in the way in which works of art are satisfactory than in any other way. And since truth itself is a certain sort of fitting or fitness, there is a sense, as Santayana says, in which all value is esthetic—a very important sense, and one much neglected.

How definitely all values, especially what we call the ultimate values, are esthetic, is nicely illustrated in Bertrand Russell's



book on China. The crucial questions about values occur in their full force when we compare alien cultures with our own. What sort of ends do we really wish realized? This is the most fundamental of practical questions. And it just *is* a matter of esthetic taste, of liking. The inadequacy, not to say wilful blindness, of our political relations to the rest of the world is partly due to the stupidity that is blind to this notion. As to ultimate ends, says Russell, "different people will answer . . . differently, and I do not know any argument by which I could persuade a man who gave an answer different from my own."<sup>22</sup> But Russell does go on to state his own answer "in the hope that the reader may feel likewise."<sup>23</sup> Whether the reader does or not depends, I should suggest, on the normality and the human vision of Russell and of the reader. Russell's book quite convinces me, and that seems to me evidence of the fact that there are possible agreements in other sorts of taste than logical.

But I cannot go farther into this realistic theory of value. I have suggested how the theory accounts for truth, and how it does this without making truth arbitrary or merely expedient or even instrumental. Truth may with satisfaction simply be contemplated. That it tends thus to become esthetic only indicates to my mind that all values in the end are esthetic. As for moral values, if they are merely conformities which we feel to be the means of living together, they are not intrinsic values at all, but mere means to the end of a satisfactory social existence. And the criteria of the satisfactory social existence themselves turn out to be esthetic, just as do the criteria of scientific theories.

I shall consider this theory sketched, then, and turn to my conclusion.

Some of the outstanding difficulties for value theory are (1) the satisfactory definition of value as means, or "contributory value," a difficulty at once apparent in the type of theory that makes value in its very nature intrinsic, that is, end-value;

<sup>22</sup> Bertrand Russell, *The Problem of China*, p. 5.

<sup>23</sup> *Ibid.*

(2) the problem of the validity and permanence of values, since they are defined as constituted in a relation to a merely human subject; and (3) the distinguishing of various kinds of value, one from another, since they are all in a sense esthetic.

The first difficulty is suggested in the case in which I make the mistake of valuing as means what is not a means to the end I have in view. I walk to the top of a hill to see the valley beyond, and when I arrive the fog completely obscures it. Commonly we say that the walk was all for nothing, that is, that it did not have any value. But while I was walking up the hill I actually chose to be so walking, really liked myself to be walking up that particular hill. Did I then not endow that activity with value? On the whole, I think not. When we value the walking *ONLY* as means we do not by virtue of so doing *like* it. We may *incidentally* enjoy just the walking; but this gives it the immediate intrinsic value of any minor esthetic pleasure. To say that we value anything *only* as means is to admit, sometimes emphatically to assert, that we do not like it at all, as one might go to the movies only to find out about crowds, or be married by a minister of the church only to satisfy an old-fashioned mother, or go to law only to secure justice. What is valuable solely as means, is not valuable at all unless it *is* a means to the end in view; and in that case its value resides in the value of the end. As Dewey says, the means, when it is indispensable, "is *such* a means that it is 'liked' . . . as an integral part of the end."<sup>24</sup> "In such cases, any *fixed* distinction between means and end breaks down. The two fuse."<sup>25</sup> Perhaps this is so, but *fusing* is a somewhat vague term to apply in the case of the means that is indispensable but unsuccessfully used, as my wasted walking up the hill. Just how this fuses with seeing a view that is never seen is not immediately clear. I prefer in these cases to say that there was no value involved at all. But I know some of the questions that might be put at this point, and I am not entirely satisfied with my statement.

<sup>24</sup> Dewey, *op. cit.*, p. 328.

<sup>25</sup> *Ibid.*

It is however unequivocal, and some of the questions of fact involved are difficult. It is perhaps true that the traditional martyr in some sense likes the very flames that consume him, the very pain that he suffers. But if he does, he is not quite the martyr we thought him. And while, for example, honesty in the analysis of the liking that we may have for even a distressing means to our end, would help a little, it will take more psychology than honesty to straighten out all the difficulties of the fusing that has been used as an explanation of the relation of the liking of means to the liking of end.

The contrasting difficulty involved in the fact that, as Dewey says, "no end is existentially final" is easier to clear up. Any relation of liking has results, we may suppose, in other relations of liking, or of judgments determining other relations of liking, and so other values. But this is only to say that value occurs temporally and actually. What we mean by an end is a state in which our relation to something or other is satisfactory in itself. This is a good state; value is here established. The fact that time goes on and that we move into the future along a track at one point of which we were in this satisfactory relation does not deny the satisfactoriness as having existed. An end is not mere means; what it leads to, it leads to; but as the chosen or liked object of a mind it is simply satisfactory to that mind immediately. Its value is intrinsic.

Of course the familiar mistaking of means for ends is one of the commonest of cases. The mutations of value have been a favorite study especially with the Austrian value theorists and with Urban. But when individuals do endow what were once mere means with intrinsic value, the only appeal to the validity of these new values is to some sort of normality in human beings. If western civilization likes motion and war, and the ancient East likes peace, it may well be held that no argument avails to convert. There simply is no standard. One of the sorts of value is perhaps doomed; but its destruction destroys the existence of a value, not the validity of the value that was

already there. Russell's book pleasantly suggests such alternative possibilities as that the western nations may destroy China and then themselves, or themselves first, leaving China to be destroyed by Japan or even perhaps to survive in peace. But Russell's book is evidence of a belief that some things are better for all human beings than other things; in fact that China may have more of such things to offer than has our own civilization.

Thus the question of contributory value leads at once to the question of the validity and permanence of value. The difficulties here appear numerous, but they are not so genuinely difficult, I think. I should simply deny that values have an ultimate validity. But this does not mean that there are not tests of value as rigorous as those of logic—the tests of logic are as a matter of fact included among them—and it seems to me that, since they are constituted in a relation one term of which is a particular sort of organic functioning of minds, they must be in many ways common to all minds. I do not know how otherwise to account for the enormous amount of agreement that we find even in the most sophisticated realms of artistic taste. Differences of taste are so much emphasized just because differences are so emphatic in their very nature. One freshman who should wear a straw hat on the college campus would cause more disturbance than the few thousand not so differentiated. So of all forms of disagreement. It is by neglecting this obvious fact that we come to take differences of taste as characteristic of taste, and this in spite of the fact, for example, that whole communities visit even the same exhibit of tapestries with pleasure, or that the numbers on the concert programs are indefinitely repeated, or that the English classics get printed and actually read for generations, while infinities of purported classics of all sorts fall into oblivion. Our theory of value as relative to individual taste leaves objects permanently valuable because individuals are so much alike. And it gives us what we call standards of value, criteria of validity even in the remotest regions of the fine arts, for the same reason.



As to standard-value itself, that is a misnomer, I think. At least it is likely to be misleading. It usually means a formula describing what many people have liked. To say that anything has standard value is *usually* to say that the thing in question conforms to a definite description or rule. Now if the description is really of what is liked, then anything has value that conforms to the description. But the assertion of standard-value is usually the assertion of the conformity only. And this conformity does not of itself constitute value. So much for questions of validity and permanence.

The distinguishing of kinds of value is an empirical difficulty. Alexander classifies them as logical, ethical, and esthetic. Economic values are of course means-values, and while the intellectual distinction that marks them off is clear enough, still as Dewey warns us, it must not be taken as a logical disjunction or an existential separation. The classification of values as logical, ethical, and esthetic at least purports to be a classification of the possible relations between mind and objects, in the way of liking, of the types of amalgamation of mind and object. There is not time now to do more than notice that this would really, if successfully carried out, classify values themselves, not merely their causes. Although I am not sure that Alexander has made it altogether clear, it seems to me the only possible basis for the classification. If mind can assume toward its objects a variety of attitudes of liking, can be amalgamated with its objects in various ways, these ways are the structures of the various sorts of value situations and the various sorts of value.

While there are thus many moot points in value theory, a great many of course which I have not mentioned, still I think that even now value theory is ready to offer several suggestions. Discussions of value in the philosophical journals tend to lose themselves in what may appear even to careful students the most arid controversy, the most empty and abstract argument, the most futile and unmeaning refining of distinctions based on no genuine differences. But this appearance, while it probably

represents fairly the nature of some of these discussions, does not fairly represent their general purport. And I wish to point out some of the really important clarifications in thought to be derived even from the present incomplete state of value theory. I have chosen three of these suggestions, one as to the nature of criticism, one a suggestion for ethics, and one the reiteration of an old point of view on a new basis, a return to Hume's doctrine of taste as fundamental in philosophy as well as in poetry and music.

The fact that valuing is not a logical process, that it is preference, and that preference is simply a reaction of a human mind in the way of liking or disliking, the fact that there is no other sort of value, and that value is thus clearly and fully irrational and in some sense direct and immediate—these facts indicate that genuine criticism in all fields depends for its validity on establishing this direct relation between the mind and the object criticized, whether the object be a scientific formulation, a philosophical theory, a social or economic principle, a religious ritual, a work of art. What we need for criticism is minds which can really see and react to what is put before them, not primarily scholars in the academic sense, but men who have observed until they are expert observers, not observers of technical details merely, but observers of the technical details as actually connected with the effects produced. The most skilful artist in the world may expend his whole technique on the ugliest of structures. An architect of the greatest learning may build the most uninteresting buildings. It is the perception, not merely of the features themselves that counts, but of the features of objects as responsible for the likings these objects have called forth. This is the basis of appreciation and of critical evaluation. On the other hand, since liking is obviously determined by training, criticism demands training, but training in first-hand observation, education by acquaintance—of which we have so little outside our purely technical professional curricula—training in perception, in accurate remembering, and in express-

ing the likes and the dislikes as related to the features of things toward which they are really directed.

Every one, no doubt, will agree with this statement as so generally put. What is difficult is the discernment of its bearing in given cases. I have time for only one illustration. Take the study of Plato. Of all the facts about Plato, of outlines and analyses of his arguments and doctrines, of accounts of his uses of particular words and phrases, we have a great supply. What seems to be missing is the one most important matter. How precisely do Plato's specific phrases contribute to the value, the *liking*, of the dialogues? How important is his dialectical method in giving his effect? Which are the really significant facts about him? But again it is hopeless to object so generally. What one knows is that the passion of Plato constituted the value he created, that this passion furnished the power that carried him through the subtle and elaborate dialectic of the *Philebus* or the *Parmenides*, that this passion was for nobility and beauty of soul, whatever those words mean, that the weight of Plato's work was borne by it, that feeling it and expressing it is the business of keeping in our world the value that Plato created. How far this business is carried on or neglected I cannot say. Its neglect in some cases of studying Plato I have at least observed, and the illustration may indicate what I mean by saying that value theory throws some light on the business of critical study.

For ethics, what value theory seems to me to do is to indicate the fatuousness of duty ethics. As standard-value is not a case of value at all, so conformity to a moral imperative is in itself not a case of value. The limitations of strict Kantian ethics have long been fully seen, but in some form or other the ethics of conformity remains dominant, and moral value itself is very widely supposed to mean conformity. What value-theory makes plain is that conformity to rule cannot as such be value. The conformity is valuable if, and in so far as, the conformity is acceptable to human minds, satisfactory to men, liked by indi-

viduals. And I hope that what I have said above makes clear that this is not making nothing of morality itself, not introducing into morals a superficial arbitrariness. It is on the contrary the one way to remove such arbitrariness from our standards. So long as these are uncritically admitted instead of being made to conform to men's genuine needs, their real likes, so long can the most absurd contents be put into them by the inspired of the Lord or of the Devil; Christian churches can preach hate, and the sophisticated dictates of an esoteric diplomacy can determine the content of patriotism, the duties of citizens.

Finally, I should like to mention one other point which I myself consider the most felicitous outcome of value-theory and its analyses. While the theory indicates that valuing is preference, it also indicates that this preference, being the act of some kind of a unified creature, a creature itself the outcome of all its past preferences, of all its history, all its mental discriminations, all its previous valuing and judgments and observings—it indicates that this preference is the creature himself. One's likings, one's tastes, are the final and most rigorous test of one's own value. The purpose of education is to learn to like the right things. That even such a man as Darwin lost, according to his own confession, so much of taste, is a comment on the danger of even the best sort of specialization. If then we fail a little in this direction of specialization, if we are not ready with the specialized products that are in such demand, or even with those that our slightly more liberal universities ask of us, it may still be the case that we create more value in the world than if we did not so fail. Efficiency in production may be a bad sign; and there may be another sort of production more exigent in its demands, more rigorous in its canons, more valuable in its outcome, an outcome revealed inwardly in spirit and outwardly in taste.

That the style is the man has been a commonplace of literary criticism since Buffon's time; but to indicate on the basis of



an adequate theory that the man's value is quite literally registered in his style is more than mere commonplace. It is in part repeating after Hume that "not solely in poetry and music we must follow our taste . . . but likewise in philosophy," and it is also making clear why following taste is as rigorous as any other procedure that could be suggested, that it is in fact the only possible one, since all the other supposed or suggested standards of procedure are at the best derived from taste. As the categorical imperative was Kant's formidable but after all meager choice, and as procreation in beauty was Plato's more fertile and generous preference, so all standards in all matters are and can be nothing but enlightened taste. We like to appeal to authority, even to eternal authority; but the price for such "mythical consolations" is, as Santayana says, that they "invalidate the . . . values they are intended to emphasize."<sup>26</sup> Or, if they do not, the very supernatural itself can give as *evidence* of its truth only its rationality. It is to be observed that any gospel's congruity with natural reason and common humanity is regarded as the decisive mark of its supernatural origin. So far Santayana. One wonders whether the theoretical study of value might not be the best method of introducing humanity to a knowledge of itself, and of discovering to men that their own limited human tastes are the one measure of value, the one intimation of the good life.

<sup>26</sup> George Santayana, *The Life of Reason*, V, p. 297.



# THE EQUIVOCATION OF VALUE

BY

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We have been told that value is just one thing—behold, there is but one name, how can there be more than one thing to be called by that name? Yet all the while value has been at least two quite distinct things.

Let us call these things immediate and standard value. The one is a fact, the other a norm; the one is instinctive, the other rational; the one is dynamic, the other regulative; the one is vital, the other a mere form, and impotent until filled with life from without. They are not even species of the same genus. To give them a common last name is, therefore, to run the risk of misrepresenting their relation (or lack of it) to one another. I do not think Picard's suggestion of calling the first 'value' and the other 'worth' much improves the situation,<sup>1</sup> for the connotation of close relationship still remains, and worth is an inconvenient word to handle. Valuation and evaluation might suggest the distinction. But there would be objections to any pair of names. Let us call them both value. There are many unrelated Smiths and Joneses; there may be as many unrelated values.

Some value theories give attention to only one of these types of value neglecting the other. Thus Epicurean ethics is a theory of immediate value only, and Kantian ethics is a theory of standard value only. And since these two (what else can we call them) types of value are totally different sorts of things, there is abstractly no reason why each should not be considered without regard to the other. But in point of fact, the fields under consideration generally imply them both, so that Epicurean ethics amounts virtually to a denial of the existence

<sup>1</sup> Maurice Picard, "Value and Worth," *Jour. of Phil.*, XIX, No. 18 (August 31, 1922), pp. 477-489.

of moral standards, and Kantian ethics almost to a denial of the existence of immediate value. That is why the Epicurean ethics lacks scope, and the Kantian ethics 'nerve,' and why both have been dropped by the philosophical wayside. A complete value theory must take into consideration both immediate and standard value, and find out their commerce with one another without confusing the two.

There is, however, one other possibility between absolute fission and absolute unity, the possibility that the one is a derivative of the other. By this device a difference is admitted without a break. Obviously two views are conceivable on this basis: (1) it may be maintained that standard value is derived from immediate value, or (2) that immediate value is derived from standard value. The one is a kind of hedonism, the other a kind of rationalism. As representatives of these two phases of this last rather promising possibility, I cannot think of two better men than Santayana and Bosanquet. Both have developed complete theories of value, both have had a suspicion of the problem involved; the one with a hedonistic bias has tried to solve it by developing standards out of immediate values much as the chemist develops molecules out of atoms or electrons, the other with a rationalistic bias has tried to show that immediate values are but fragments of standards like the shuffled-up pieces of a child's picture puzzle. Both feel sure that there is no essential difference between immediate values and standards. They differ only in their methods and between them they exhaust the methods applicable. What I wish to show is that in no case does either of these methods make the transition from immediate to standard value, or the reverse, which they were supposed to make. Either the bridge dangles in the air and never touches the other side, or its timbers are rotten at the heart and it crumbles when the first strain is put upon it.

The most conspicuous fields to which value theory is applied are those of ethics, aesthetics, and logic—the ancient trio of the good, the beautiful, and the true. There is nothing particularly

illuminating or fruitful in this way of dividing up the total area of values. It is neither an exhaustive division nor one in which the parts are mutually exclusive. It is probably a survival from the abandoned faculty psychology and its still more ancient trio of the will, the intellect, and the sensibility. But since the proper classification of values is not our problem here, there can be no harm in our accepting this time-honored division of the subject for our purposes of concrete criticism. It is a division implicitly accepted (in some degree at least) by both Santayana and Bosanquet, and is sufficiently typical to bring out most of the problems one is likely to meet in the theory of value.

It is the peculiarity of ethics that the demands of immediate and standard value are evenly balanced, so that lack of attention to either one of these types of value in a moral theory is straightway felt. The problem of a philosopher, therefore, who attempts to develop one of these types of value out of the other is most clearly exhibited in this field. We shall accordingly take up the moral theories of each of our philosophers first. In aesthetics the demand of standard value is much weaker than that of immediate value. In logic the demand of immediate value is much weaker than that of standard value. Consequently, though the problem before our philosophers is most apparent in moral theory, it is most acute in aesthetic and logical theory. It is a great temptation for a philosopher to ignore the demands of standards in aesthetics and of immediacy in logic. Santayana virtually does this; Bosanquet is more conscientious.

Of course, it may be that really there are no standards in aesthetics nor any immediate values in logic. But it is clear that Santayana and Bosanquet cannot say so. In their moral views they commit themselves to a certain theory of value—to the theory, namely, that standard value is derivable from immediate value or the opposite, and that there is no absolute difference between the two. They have no right to shift their ground when they find it inconvenient to apply this theory to

aesthetic and logical problems. The most that we could grant Santayana, seeing that he takes immediate value as primitive and derives standard value from it, is that because of some abnormality in art aesthetic values never congeal into standards. But we cannot excuse him for failing to discover immediate values in logic. For by his hypothesis standards are derived from immediate values. It follows there can be no standard of truth without some immediate values from which to derive it. Or if Santayana objects to being cornered thus, he may take his choice of the following alternatives: either that truth is not a value, or that it is a totally different kind of value. The choice would not be very inviting to Santayana, for the two alternatives amount to the same thing except for a difference of nomenclature: they amount to exactly the thesis I am trying to urge in this paper. Call standards values or not as you please, they are not the same thing as immediate values, not even the progeny or the collaterals of them. They are a different species of being. And if Santayana admits this of truth, I see no reason why he should not admit it of moral standards or of any other kind of standards. The same line of argument applies in the opposite direction to Bosanquet.

Now let us see in detail, first what Santayana and then what Bosanquet does in turn with the good, the beautiful, and the true.

Santayana defines immediate value in terms of interest, which is the contemporary descendant of pleasure in most modern hedonisms (if we may call them hedonisms). The term 'interest' avoids most of the traditional criticisms to which 'pleasure' was subject, and retains most of the advantages which rendered the earlier hedonisms philosophically attractive. The difficulties with a pleasure hedonism and the advantages of an interest hedonism Santayana points out in the following passage:

. . . pain and pleasure are not the ultimate sources of value. A correct psychology and logic cannot allow that an eventual, and, in strictness, unrepresentable feeling, can determine any act of volition, but must insist that, on the contrary, all beliefs about future experience, with all premonition



of its emotional quality, is based on actual impulse and feeling; so that the source of value is nothing but the inner fountain of life and imagination, and the object of pursuit nothing but the ideal object, counterpart of the present demand. Abstract satisfaction is not pursued, but, if the will and the environment are constant, satisfaction will necessarily be felt in achieving the object desired. A rejection of hedonistic psychology, therefore, by no means involves any opposition to eudaemonism in ethics. Eudaemonism is another name for wisdom; there is no other *moral* morality.<sup>2</sup>

Or, more briefly, "The first step in making pleasure intelligible and capable of being pursued is to make it pleasure in something. The object it suffuses acquires a value, and gives the pleasure itself a place in rational life."<sup>3</sup> Such is Santayana's definition of immediate value. It is not constituted by pleasure alone, abstract pleasure, but by an object "suffused with pleasure," the object of impulse or feeling. Santayana in some contexts calls it interest, which being a well recognized term in philosophy today may be taken for what he intends as the unit of immediate value.

But loose interests do not determine a standard. One pulls one way and another another, and individually all are equally deserving. "If we merely transcribe these miscellaneous demands or allow these floating desires to dictate to us the elements of the ideal," says Santayana, "we shall never come to a Whole or an End."<sup>4</sup> But this sorting is not something left merely to chance, or (for it is the same thing) to the action of physical laws. Ethics is not anthropology. "The science of ethics," says Santayana,

has nothing to do with causes, not in that it need deny or ignore them but in that it is their fruit and begins where they end. . . . What ethics asks is not why a thing is called good, but whether it is good or not, whether it is right or not so to esteem it. . . . So if I ask, Is four really twice two? the answer is not that most people say so, but that in saying so I am not misunderstanding myself. . . . Hence good, when once the moral or dialectical attitude has been assumed, means not what is called good but what is so; that is, what *ought* to be called good.<sup>5</sup>

A standard, then, must be established to adjudicate among interests.

<sup>2</sup> *Life of Reason*, I, 237-238.

<sup>4</sup> *Op. cit.*, I, 261.

<sup>3</sup> *Op. cit.*, I, 56.

<sup>5</sup> *Op. cit.*, V, 215-216.

But this standard (and here is the important point for us to notice) is not something different from the interests; on the contrary, it grows out of the interests, is similar in kind to them though not in function. Santayana writes,

. . . present demands are the only materials and occasions for any ideal: without demands the ideal would have no *locus standi* or foothold in the world, no power, no charm, and no prerogative. If the ideal can confront particular desires and put them to shame, that happens only because the ideal is the object of a more profound and voluminous desire and embodies the good which they blindly and perhaps deviously pursue. Demands could not be misdirected, goods sought could not be false, if the standard by which they are to be corrected were not constructed out of them.<sup>6</sup>

The standard, then, is to be derived from interests.

But how is it to be so derived? Why, by the systematic organization of all interests so that there will be the maximum of satisfaction with the minimum of frustration. It is the modern sophisticated version of the Greatest Happiness Principle of traditional utilitarianism, the unit now being not pleasure but interest, and the emphasis now being laid not on the mere summation of units but on organization.<sup>7</sup> As Santayana states it, “. . . the only sense in which an ultimate end can be established and become a test of general progress is this; that a harmony and coöperation of impulses should be conceived leading to the maximum of satisfaction possible in the whole community of spirits affected by our action.”<sup>8</sup> And again, “. . . a rational mind would consider, in its judgment and action, every interest which that judgment or action at all affected; and it would conspire with each represented good in proportion, not to that good’s intrinsic importance, but to the power which the present act might have of helping to realize that good.”<sup>9</sup> In short, the moral worth of an action is to be judged by reference to its bearing on all relevant interests organized about it, which would mean logically, I should have thought but for Santayana’s explicit affirmations to the contrary, all actual and potential interests whatever in the universe. But, as we shall see presently,

<sup>6</sup> *Op. cit.*, I, 257-258.

<sup>8</sup> *Op. cit.*, I, 256.

<sup>7</sup> Cf. *op. cit.*, V, 256-258.

<sup>9</sup> *Op. cit.*, V, 261.

Santayana makes these affirmations too late. He begins to see where his logic is leading him and draws back, but the momentum he has gathered carries him over the precipice in spite of himself. For the real issue at stake he passed long before when he came over the hill and had not yet started running down the other side.

For the issue at stake is this: why should any man recognize the organization of all relevant interests as his standard? What is its sanction? And this is a fair question to put to Santayana, for he has guaranteed to derive the standard from primitive interests. The standard should have the same obviousness as the interests. It is nothing other than the transition from individual to universal hedonism. There is no difficulty in showing that any enlightened individual would find it advisable to organize his own interests "for the maximum of satisfaction possible" among them. But what could induce him to organize them with other men's interests? That Santayana feels there is a difficulty here seems probable from the fact that in the six pages where he deals with this transition<sup>10</sup> he suggests no less than three possible ways over, hoping apparently that if one plank breaks another may hold. All three are rotten or cracked, however.

The first he describes as follows:

The knowledge of what other people desire does not abolish a man's own aims. Sympathy and justice are simply an expansion of the soul's interests, arising when we consider other men's lives so intently that something in us imitates and reënacts their experience, so that we move partly in unison with their movement, recognize the reality and initial legitimacy of their interests, and consequently regard their aims in our action, in so far as our own status and purposes have become identical with theirs. We are not less ourselves, nor less autonomous, for this assimilation, since we assimilate only what is in itself intelligible and congruous with our mind and obey only that authority which can impose itself on our reason.<sup>11</sup>

In short, man is so sympathetic by nature that other men's interests become his own and merely to organize his own interests insures the recognition of all other people's relevant interests. The reply to this suggestion is simply that it is contrary to fact.

<sup>10</sup> *Op. cit.*, V, 246-251.

<sup>11</sup> *Op. cit.*, V, 246-247.

What do laws, and the police, and courts, and prisons imply but that men often find their own interests much more attractive than other people's, and that arbitrary external means have to be invoked to force men to think of these other people? Also sympathetic imagination is a variable gift among men. If we must rely upon that for our moral judgments, these judgments will be either rare or strangely various.

Feeling the weakness of this argument, no doubt, Santayana hastens to support it by another. "There is one impulse," he writes,

which intuitive moralists ignore: the impulse to reflect. Human instincts are ignorant, multitudinous, and contradictory. To satisfy them as they come is often impossible, and often disastrous, in that such satisfaction prevents the satisfaction of other instincts inherently no less fecund and legitimate. When we apply reason to life we immediately demand that life be consistent, complete, and satisfactory when reflected upon and viewed as a whole. This view as it presents each moment in its relations, extends to all moments affected by the action or maxim under discussion; it has no more ground for stopping at the limits of what is called a single life than at the limits of a single adventure. To stop at selfishness is not particularly rational. The same principle that creates the ideal of a self creates the ideal of a family or an institution.<sup>12</sup>

In short, there is an instinct of rationality, which is itself an interest, and which automatically puts an individual's own interests on a level with other people's interests in the construction of a moral standard. But the answer to this is simple and decisive. If the interest in rationality is merely one interest among others, it must take its chances among the others. There is nothing inherent in the definition of immediate value which would clothe one instance of such value with authority over all other instances. Barring differences of intensity, every interest (that is, every instance of immediate value) has an equal claim to fulfillment. And the problem on Santayana's hands is precisely to explain by what principle some of these interests are to be rejected and others satisfied. To call attention to an interest in rationality does not help him in the least out of his

<sup>12</sup> *Op. cit.*, V, 249-250.



predicament, because that is simply one interest out of thousands of others and in its status as interest has no rights above any of the others. Granted that it is a powerful organizing interest, there are equally if not more powerful disorganizing interests like those of sex, and pugnacity, and acquisitiveness. What could a mere interest in rationality do against such as these? If it is upon one individual interest that Santayana must put his reliance to organize all other interests into an authoritative standard, he would do better to stick to sympathy, which is on the whole a much stronger interest than that of rationality. But the objection to both is the same. There is no sovereign interest with undisputed authority over all other interests.

Santayana seems to become sensible of this as he proceeds and imperceptibly glides from an appeal to an *interest* in rationality to that of a *principle* of rationality. The transition takes place in the very passage quoted a moment ago. The paragraph begins thus: "There is an impulse which intuitive moralists ignore: the impulse to reflect." But it ends thus: "To stop at selfishness is not particularly rational. The same principle that creates the ideal of a self creates the ideal of a family or an institution." At the beginning of the paragraph rationality is an impulse; at the end it has turned into a principle.

Now we might regard this as a mere rhetorical change of terms for variety's sake. Santayana has an irritating way of dragging rhetoric over his philosophy and blurring the outlines, which makes glorious rational poetry but provoking science. The term 'interest' which I have selected to use for the name of the unit of immediate value is simply one of a long list of synonyms employed by Santayana with apparently identical denotation—e.g., impulse, instinct, satisfaction, demands, sometimes even pleasure. But we must not cavil at a characteristic of a great philosopher, which is perhaps one of the very conditions of his greatness.

Such being a peculiarity of Santayana's style, it may be that he intended to use "impulse" and "principle" as synony-

mous terms. But what follows makes this interpretation very doubtful, for the next paragraph, summarized in the margin "self-love artificial," states that the distinction between self and other is not a distinction of any great moment. "For reason the person itself has no obstinate existence," he writes, "*the man's life*, the circle drawn by biographers around the career of a particular body, from the womb to the charnel house, and around the mental flux that accompanies that career, is no significant unity."<sup>13</sup> Having thus annihilated the self, he is able to give us a little farther on the standard toward which he has been aiming.

Each impulse included within these limits [the limits of the sentience] may be as directly compared with the represented impulses of other people as with the represented impulses expected to arise later in the same body. Reason lives among these represented values all of which have their cerebral seat and present efficacy over the passing thought; and reason teaches this passing thought to believe in and respect them equally. Their right is not less clear, nor their influence less natural, because they may range over the whole universe and may await their realization at the farthest boundaries of time.<sup>14</sup>

The ground has obviously shifted. It is no longer an isolated interest of rationality that Santayana is talking about, but a principle of rationality. It is "*for reason*" that "the person itself has no obstinate reality." From the point of view of interests, of course, this assertion is absurdly false. Our own interests (not necessarily all of them selfish ones, but our own) have a warmth and self-evidence that other people's interests simply do not physically or psychically possess. It is only the principle of reason that "teaches this passing thought to believe in and respect them equally," and it is only in the presence of this principle that "the right" of other people's interests "is not less clear" than that of our own. And that the reason referred to here is a principle and not that mere impulse above referred to, is evident in that this reason acquires dominance over all interests whatever by right of eminent domain, and in

<sup>13</sup> *Op. cit.*, V, 250.

<sup>14</sup> *Op. cit.*, V, 251.

that it has the capacity of annihilating "the person itself." It has powers which no single interest could possibly possess.

And what, in short, would be Santayana's argument based on a clearly discerned principle of reason (as distinguished from an interest of rationality)? It would go like this. An interest is a unit of value. The satisfaction of two interests is consequently more valuable than the satisfaction of one interest. The organization of all of an individual's interests to bring about the greatest sum total of satisfaction is accordingly more valuable than a life of chaotic mutually interfering interests which renders a smaller sum total of satisfaction. Therefore, by the same principle the organization of all interests whatever in the universe, giving the greatest grand total of satisfaction, is the maximum of moral value attainable, and consequently the moral standard. As a corollary to this final proposition it appears that if in the process of universal organization of interests all of an individual's interests or all of a group's interests should be frustrated, that individual and that group ought morally to approve of their own consignment to unmitigated misery or extermination. Just suppose that such a conclusion should be reached by a group of disinterested scientists regarding the United States of which most of us are citizens, and suppose, too, that their conclusions appear to us absolutely convincing (*per impossible*); would we hasten to exterminate ourselves for the future happiness of India, and China, and Europe? Would not we hasten to develop another morality a little less rational and a little more nearly true to the world? Even Santayana draws back from the ultimate implications of his moral standard. "A statesman entrusted with power," he writes, "should regard nothing but his country's interests; to regard anything else would be treason."<sup>15</sup> And he also admits that "to weed a garden . . . would be rational, though the weeds and their interests would have to be sacrificed in the process,"<sup>16</sup> though on Santayana's premises I am not so sure it would be.

<sup>15</sup> *Op. cit.*, V, 259.

<sup>16</sup> *Op. cit.*, V, 260.

Now what these instances show is that somewhere in the universal rationalizing of interests, Santayana has lost communication with his base of supplies. It was his intention to develop a standard out of interests. In his own words quoted earlier, "present demands are the only materials and occasions for any ideal." But he has been forced to introduce a new material—the principle of rationality. Interests organize of their own accord only within the boundaries of an individual organism. For it is responses that gather interests up into systems for the sake of action, and it is only individual organisms that make responses. But such individual systems of interests are not generally regarded as satisfactory moral standards, nor does Santayana regard them so. After two abortive attempts to transcend the individual by means of specific interests (sympathy, and the interest of rationality), Santayana finally invokes the aid of a purely formal external principle, the principle of rationality. This carries him over to the over-individualized standard which was his goal, but in the passage he has been forced to cut loose from the immediate values from which the standard was to be derived. The fact that the standard includes these values as its subject matter is irrelevant; it is not supported by them. Santayana is thus confronted with the dilemma that we predicted. Either there is no moral standard, or it is something not derivable from immediate value and the kind of value that proceeds from it is something totally different in nature.<sup>17</sup>

<sup>17</sup> The sanction of immediate value is pleasure, but the sanction of Santayana's standard is not happiness (cf. *op. cit.*, V, 251–252), as he erroneously believes, carried away as he is by the apparent implications of his formal principle, but reason. Santayana would not try to persuade a self-centered man to acknowledge the standard by telling the man that happiness would result, but by showing him how *unreasonable* it would be to sacrifice the general happiness to one's own individual pleasures. The sanction is *reason*: that is where the argument gets its force. The retort is always ready, however: Why be reasonable? And that is where Santayana's standard comes up against a blank wall. Why be reasonable, indeed? Because, I suppose, it happens to be a philosopher's prejudice.



We shall find he succeeds no better with aesthetic value. A hedonistic theory of aesthetic value always has two problems on its hands: first, to differentiate aesthetic pleasure from pleasure in general (or, in the more accurate terminology, aesthetic interest from interest in general); and secondly, to determine the aesthetic standard. And in aesthetics the gap between immediate and standard value is far more obvious than in ethics. The trite maxim, *de gustibus non disputandum est*, and the desperate expedients philosophers have been driven to in their attempts to explain this maxim away, bear eloquent witness how wide the gap yawns. And we must not forget that a hedonist who refuses to acknowledge the existence of the gap is under logical obligation to derive his standard from his immediate values.

The problem of differentiating aesthetic pleasure from pleasure in general need not detain us, since that is a problem irrelevant to the matter in hand. Suffice it for the purpose of illustration to give Santayana's differentia. He extracts this differentia in Part 2 of *The Sense of Beauty*, concluding his analysis as follows, "We have now reached our definition of beauty, which in terms of our successive analysis and narrowing of the conception, is value positive, intrinsic, and objectified. Or, in less technical language, Beauty is pleasure regarded as the quality of a thing."<sup>18</sup> Objectified pleasure, then, is immediate aesthetic value, and theoretically the aesthetic standard should be directly derived from this.

There are three common ways in which such derivation is attempted in hedonistic aesthetics. One is to identify the aesthetic standard with the moral standard, which has presumably been satisfactorily derived from immediate value already. This is ultimately Fechner's expedient. Another way is to dwell on the general physiological similarity of man and man, and consequent fundamental similarity in their likes and dislikes. This is the expedient Grant Allen on the whole relies

<sup>18</sup> *The Sense of Beauty*, p. 49.

on. The third way is to appeal to the aesthetic expert, either as an ideal or as an actual person. This is Marshall's expedient.

Santayana makes veiled appeals to all three, but chiefly to the last.<sup>19</sup> But all three fail to derive the aesthetic standard from immediate value. The appeal to the moral standard fails, because, as we have seen, it is impossible to derive the moral

<sup>19</sup> For the appeal to the moral standard see the section headed "Good taste demands that art should be rational, i.e., harmonious with all other interests," (*L. of R.*, IV, 206-208), and especially the four or five sentences leading up to "A civilized imagination has to understand and to serve the world." How far he wishes to carry this idea is not clear. Perhaps all he intends by this passage is what nearly everyone would grant, that an immoral work of art cannot be countenanced, or in other words, that where the aesthetic and the moral standard conflict the moral standard will be given precedence; not that the aesthetic standard is the moral standard. In this connection the section headed "Contrast between aesthetic and moral values," in *The Sense of Beauty* (pp. 23-25) should be considered, though in the context the presumption would be that he was discussing here not the contrast between moral and aesthetic standards but that between the immediate values of ethics and aesthetics.

For the appeal to general physiological similarity see the section headed "The differentia of aesthetic pleasure not its universality" in *The Sense of Beauty* (pp. 40-44). Though the general trend of this passage is emphatically negative, there is an affirmative undertone, though it may be supplied by nothing more than the truism, "If their [two men's] senses are the same their associations and dispositions similar, then the same thing will certainly be beautiful to both" (p. 41). The undertone gathers almost the strength of a fundamental, however, when we read pages 199 to 206 of the *Life of Reason*, IV, and especially such sentences as "They [the critics] do not come to justify the poet in his own eyes; he simply relieves them of such a function. They come only to enquire how significant the poet's expressions are for humanity at large or for whatever public he addresses. They come to register the social and representative character of the poet's soul. . . . A work of art is a public possession; it is addressed to the world. . . . It wants more approval than its own, it cannot afford to regard no other aspiration. This scope, this representative faculty or wide appeal, is necessary to good taste" (pp. 201-202). What Santayana could mean here by "representative faculty or wide appeal" except universality based on general similarity of physiological structure it would be difficult to surmise.

For Santayana's appeal to the expert read the following sentence from *The Sense of Beauty*, ". . . the true test [of merit in a work of art] is the degree and kind of satisfaction it gives to him who appreciates it most" (p. 43). "To him who appreciates it most," the expert. But consider especially the implications of all the first part of the chapter on the criterion of taste in *L. of R.*, IV, where emphasis is laid on the differences in volume and consistency of people's experience, that judgment being best which issues from the most voluminous and consistent experience, in short, from the experience of the expert. Note particularly the illuminating section where Santayana describes the way in which standards originate and grow. *L. of R.*, pp. 194-196.

standard from immediate value. The appeal to physiological similarity fails, because it does not even give a standard. It amounts to the inane proposition that so far as people are similarly constituted they will have similar likes and dislikes. There is no sense in saying that a person ought to be differently constituted, that a blind person ought to be able to see and appreciate pictures, or that a deaf person ought to be able to hear and appreciate music, or that anybody ought to appreciate anything because somebody else who happens to be differently constituted does. The weakness of this argument brings about a hasty appeal either to some sort of majority vote (which is a still greater absurdity) or to the expert.

As Santayana apparently surmised, the expert is the last and only hope for such a value theory as his. What are the implications of such an appeal? They amount to this: that I immediately value the immediate values of an expert for a work of art. Superficially it looks as if my immediate aesthetic values had been transcended and superseded by the immediate values of the expert, as if an aesthetic standard had been derived from my immediate aesthetic values. But that is an illusion. To value another man's values does not make his values mine. My own values glance curiously at the foreigner's and continue in their old way. I may think the world of a critic's judgment, but I will still shudder at a Picasso. Our immediate aesthetic values are stubborn. Reason with them and beat them as we will, they plod along pretty much at their own gait, and we make more rapid progress by feeding them well than by any amount of pointing to the glorious goal we hope they will reach. For here as with the moral standard it is not the mass of immediate values that develops the standard and makes it attractive, but an external rational principle. It seems reasonable that the greater a man's experience in art the sounder should be his judgment. We show deference, therefore, to an expert's judgments. But that does not mean that our own

immediate values change in consequence, or that the expert's immediate values are somehow derived from our own.<sup>20</sup>

We are confronted, therefore, as in the field of morals, with the dilemma: either there is no aesthetic standard, or it is of a nature totally different from that of immediate values.<sup>21</sup>

In dealing with Santayana's theory of truth we are hampered not only by ambiguities but also by the meagerness of his revelations on the subject. He uses the term, truth, in at least three different senses: as the system of subsistent propositions that have their dwelling place in the sort of Platonic world which he believes in;<sup>22</sup> as logical cogency, or validity, the self-consistency

<sup>20</sup> The difficulty in this way of dealing with the matter is really more serious than I have made it out. For the value we attach to an expert's judgments is not generally an immediate value, but an instrumental one. We want to know what the expert values in order to know what would be socially regarded as the proper thing to value, or what in some distant future after sufficient experience we may ourselves expect to value. We value the expert's judgments as a means, not aesthetically, so that there is not even an apparently continuous transition (as I implied in the text) from my immediate aesthetic values to the expert's immediate aesthetic values. An instrumental value comes between the two groups.

It is instructive in this connection to recall that J. S. Mill in his *Utilitarianism* made a similar appeal to an expert in his attempt to develop a moral standard. The same gap appears in his ethics as in Santayana's aesthetics.

<sup>21</sup> There is a passage in volume 5 of the *Life of Reason* that has caused me a good deal of perplexity. Santayana is explaining what he means by prerational morality. "When morality is . . . non-dialectical, casual, impulsive, polyglot, it is what we may call prerational morality," he writes (p. 211). Then presently he gives us illustrations of such "impulsive" unstandardized judgments. "On this stage, in the moral world," he tells us, "are the judgments of Mrs. Grundy, the aims of political parties and their maxims, the principles of war, the appreciation of art, the commandments of religious authorities, special revelations of duty to individuals, and all systems of intuitive ethics" (p. 212). Observe "the appreciation of art." What does Santayana mean by the "appreciation of art" here in the middle of a list of pseudo-moral judgments? Does he not mean, forgetting for a moment the introductory phrase, "in the moral world," that the appreciative judgments of art are also impulsive and unstandardized? And would not that imply that there is no aesthetic standard, that the appreciation of art stopped on the pre-rational level just as "all intuitive systems of ethics" do? If so, here is another view of Santayana's regarding standards coqueting at us from behind her veil. And we begin to wonder how widely we should have interpreted his statement in *The Sense of Beauty*, "It is unmeaning to say that what is beautiful to one man ought to be beautiful to another" (p. 41).

<sup>22</sup> e.g. "The abstractions of science are extractions of truths" (*L. of R.*, V, 72).



of a logical system;<sup>23</sup> and as the correspondence of a thought with its object.<sup>24</sup> There need not, of course, be any contradiction among these three senses of the term 'truth'; for they are three quite distinct things, as distinct from one another as a triangle, longitude, and a hog grubbing for truffles. And we should not have to trouble Santayana about a mere matter of naming were it not that we wish to know which one of these truths is to be regarded as a standard of value.

But the fact is that when it comes to truth value, like most other empirical philosophers, Santayana throws up his hands. He leaves us in doubt even as to whether it is a value, and he makes no attempt whatever to derive a standard of truth from immediate truth values as in the cases of ethics and aesthetics. Such an attempt is not inconceivable. The pragmatic theory of truth is essentially one that regards truth as an immediate value. Truth, they say, is a characteristic of judgments. A judgment that proves satisfactory by solving a concrete human problem is a true judgment. We have thus quantities of immediate truths often conflicting like the immediate values of ethics and aesthetics. But the pragmatists give us nothing but a welter of relative or immediate truths. Now a view which would derive one of Santayana's suggested standards of truth from pragmatic immediate truths would be a view that made truth a value of the same sort as that of the *summum bonum* in a (supposedly) consistent utilitarian ethics. It would be hardly worth while trying to develop such a theory of truth, however, since we can clearly see beforehand that it would have to face the same dilemma as that which Santayana's moral and aesthetic theories

<sup>23</sup> e.g. ". . . truth or logical cogency" (*L. of R.*, V, 30).

<sup>24</sup> "The other problem touches the degree of similarity between the immediate data or symbols of sense or thought and the intrinsic qualities of the substance which is its object; and here the tendency of the realist is to reply that the similarity is great, and may even rise to identity of essence" (*Essays in Critical Realism*, p. 165). From this passage one would infer that Santayana's correspondence theory of truth is very similar to that of Strong's, explained in some detail in the last essay of the series just referred to.

have had to face. The same unbridgeable gap would appear between the immediate truth values and the truth standard; for immediate pragmatic truths get their value from purposes fulfilled, desires satisfied, but all of the three standards suggested by Santayana (subsistent propositions, coherence, and correspondence) stand aloof from aggressive purposes and desires. As well think of deriving water from the fire it extinguishes as of deriving such standards from purposes and desires. It is the instinctive recoil from this absurdity that plunges pragmatism into the greater absurdity of denying that there is any absolute standard of truth or any determinate structure of reality. And it is a scenting of the same absurdity that restrains Santayana from attempting to develop a theory of truth parallel to his moral and aesthetic theories. For Santayana truth remains an anomaly, a valueless value.

Such, then, are Santayana's adventures in trying to cross the chasm between immediate and standard values. Let us now see if Bosanquet has any better success. Santayana explored up and down the nether side of the cañon trying to find a place among immediate values to throw a bridge over to the standard values. Bosanquet explored the other side of the cañon trying to find a place to throw a bridge from standard to immediate values. We can describe the course of Bosanquet's explorations in a more summary manner than we did Santayana's. For idealists do things in a grand way; no timorous pecking at a problem here, and then there, and then somewhere else; they invest all their money in one grand promoting scheme, and if that fails go into utter bankruptcy.

Bosanquet's scheme is to derive the whole universe from a self-consistent organic whole, which he calls the absolute. And a single principle given free rein he thinks adequate to perform this prodigious task, the principle of non-contradiction. There is, however, a slight difficulty due to human infirmity, which occasionally gets him somewhat tangled up in his exposition.

Logically or ontologically all the parts of the universe are derived from the absolute; that is, derive their significance, their value, their being from the whole. Psychologically, however, or adventitiously, our knowledge of the absolute is derived only through an expansion of our experience from chance bits or fragments of the universe. There are thus two movements to be detected in the absolute; the ontological movement of values down from the absolute to the fragments, and the psychological movement of knowledge from the fragments up toward the absolute. These two opposite movements are apt to be confusing. But it is foolish to be confused by these movements because regarded as movements Bosanquet would assure us they are both illusory in the ultimate. In the absolute as a whole every part has its place and its value given in a harmonious eternity, and under that aspect there are no groping expansions of experience nor mad claims for value and significance. These expansions and claims are illusions due to our finite, fragmentary nature. We are foolish to think about such ghosts. But the fact is that though it may be foolish, we do think about them; and it is just this foolish fact that leads to the failure of Bosanquet's whole enterprise.

But it is only the bearing of this difficulty on Bosanquet's theory of value that we are now interested in. That Bosanquet regards the absolute as a standard of value and intends to derive all value from it is obvious from many passages that might be quoted. The following will serve as well as any other: "If the universe is taken to be a perfect conscious being, then, judged comparatively to its members, and as giving and being the standard, it is relatively good and the fulfilment of all ideas.—Strictly, you do not value it; you value all else by it. Its value is the unit, and all other values must be adjusted so as to amount to it."<sup>25</sup> But it is equally obvious that Bosanquet does not intend it to be a mere standard; i.e., he does not intend to leave

<sup>25</sup> *Prin. of Indiv. and Value*, pp. 310–311.

it high and dry, a mere formal principle like Kant's Categorical Imperative, permanently cut off from the immediate values created by pleasure, desire, and the like. The very wording of the last phrase of the passage just quoted ("and all other values must be adjusted so as to amount to it") shows Bosanquet's intention. Other values are not merely to be judged by it, but to be "adjusted so as to amount to it." The immediate values of affection and conation are not to be denied or cut off from standard value, but are to be derived from it. As I said at the beginning, we have in Bosanquet's value theory one that agrees with Santayana's in aim but differs totally in method. Santayana's method having failed, Bosanquet's method is the only alternative.

But if Santayana was never able to reach a standard from immediate values, Bosanquet never legitimately reaches any immediate values from his standard. For we must remember that Bosanquet's standard is really nothing but absolute self-consistency, nothing but logical system. The principle of non-contradiction that holds the system together is a purely logical principle, and could not possibly breed pleasures and desires. Pleasure and desires could be evaluated by such a principle set up as a formal standard. But that is not what I mean by deriving immediate value from standard value, nor is it what Bosanquet would mean by evaluation. How, then, does Bosanquet deceive himself into the belief that immediate values are also accounted for through his standard? By a couple of confusions.

His first confusion is this: He discovers that in actual introspective experience pleasure and desire are never present without elements of thought being present at the same time.<sup>26</sup> These elements of thought easily succumb to the allurements of the absolute. Therefore, Bosanquet assumes that they carry along

<sup>26</sup> Cf. *op. cit.*, pp. 61-68, where Bosanquet shows how thought is implied in sense, feeling and will.



the affective and conative elements also. He helps to deceive himself by creating ambiguities among the terms 'satiety,' 'satisfaction,' 'happiness,' and 'perfection.' To see how he makes use of the first pair, take the following passage: "The recovery of equilibrium means satiety, and this is one with the completion of the conative process. This is the account of ordinary desire and its satisfaction which Plato on the whole accepted. . . ." <sup>27</sup> Here satiety and satisfaction are taken as equivalents and applied to immediate value. But presently we learn that "in the simplest case of conation satiety and satisfaction coincide. But if end is to mean a value, satisfaction must be more than satiety." <sup>28</sup> Here satiety is immediate value but satisfaction is standard value. But though the distinction is apparently made clear, something of the connotation of immediate value is carried over into satisfaction and is never completely eliminated. The term, satisfaction, is too well identified with immediate value to be suitable for such a use as Bosanquet puts it to. <sup>29</sup> As for the ambiguity in the second pair, one sentence is enough, "'Happiness,' I take it, here [referring to Plato's *Republic*] may fairly be said to equal value, i.e., felt perfection." <sup>30</sup> Even the word "felt" in this quotation is ambiguous. The only flavor of immediate value that finds its way into the absolute is that which ambiguous words illicitly carry there.

The second confusion that deceives Bosanquet into the belief that feelings and conations find their way into the absolute is one I have alluded to already, his failure to distinguish the psychological evolution of experience toward the absolute (so far as something of this sort does take place in an actual, living mind) from the logical devolution of value from the absolute. When he is talking about value in general, his thought moves from the absolute down; but when he is talking about particular

<sup>27</sup> *Op. cit.*, p. 128.

<sup>28</sup> *Op. cit.*, p. 131.

<sup>29</sup> Cf. a passage, pp. 298-299, which is very instructive in this connection

<sup>30</sup> *Op. cit.*, p. 313.

values, his thought moves from the bottom up. The former mood is in the real spirit of his system, for there is no genuine value short of the absolute; but the latter mood is the one that fills his system with good concrete experience surreptitiously spirited up the back stairs. Actually, there are passages of Bosanquet's written in this second mood which almost prompt one to turn the book over to make sure it is not Santayana that is writing. Only the differences of style and vocabulary assure one it is still Bosanquet. For in his concrete mood Bosanquet is an up-to-date hedonist, for all the world an elephantine imitation of Santayana. The most compact passage I can quote to exhibit Bosanquet in his concrete mood is perhaps the following: "Where we have interest, and so far as we have it, we have implication in reality; where we have more stable and satisfactory interest, we have more implication in reality."<sup>31</sup> Notice carefully the wording, "Where we have interest, *and so far as we have it.*" (Italics mine.) It is in "so far as we have" interest that we "have implication in reality," i.e., value. Interest, then, appears to be the source of value; and the organization of interests (the more stable and satisfactory interest) appears to be the standard of value; and the standard appears to derive its value from the interests. The movement is from the bottom up. It is Santayana hedonism in idealistic lingo. But Bosanquet is stupefied under the spell of the lingo, for four pages farther on what do we find but this?—"If we assign value to any whole as a unit, it may be urged that values relative to this though derivative from it, must in some sense be assignable to all factors which are in any way involved in the whole; but then any such assignment does not imply any value in the factors taken by themselves."<sup>32</sup> In no sense, then, according to this passage, is value assignable to a part detached from the

<sup>31</sup> *Op. cit.*, p. 300.

<sup>32</sup> *Op. cit.*, p. 304.

whole. No individual interest can have value by itself, but only as a part of a whole which as a whole is valuable.<sup>33</sup>

Now which is to be the source of value, the interests or the whole? Does the whole get its value by being an organization of interests, or do the interests get their value by having a relation to the whole? Bosanquet cannot say both, because the source of value in the two cases are at nadir and zenith from each other, and to choose either one or the other leads him into trouble. For if he should say (which he probably would not) that interests are the source of value, he would have to face all the difficulties with which we have tortured Santayana, while if he accepts the other alternative and derives all value from the absolute, he has left interest permanently behind and has

<sup>33</sup> A comparison of this passage with one already quoted on page 125 ("Strictly, you do not value it; you value all else by it"), indicates that Bosanquet is suffering from still another confusion, that between instrumental and standard value. In the passage quoted on this page the argument is that if anything is valued as a whole anything like a part of the whole which supports or is instrumental in creating the whole must be valuable for its function. The argument is based on the means-end situation. In the passage quoted on page 127, however, the argument is that if anything is set up as a standard, other things may be regarded as possessing more or less value in proportion as they come up to that standard. The other things, such as the parts of a whole, in so far as they resemble the whole are endowed with value, but the standard itself or the whole in this case is not "strictly" valuable at all because it is absurd to compare an object with itself.

There is, to be sure, no contradiction in the view that the absolute possesses both instrumental and standard value. But the attribution of value to the different parts of the absolute varies greatly with the type of value under consideration. For remembering that according to Bosanquet's conception of the absolute it is an organic whole bound together by an internal system of relations such that every part is essential to every other part and to the whole, we are driven to the conclusion that judged on the basis of instrumental value every part of the absolute is just as valuable as any other part. For the destruction of the smallest fragment would be as disastrous to the absolute as, indeed, the annihilation of the whole system at a blow. On the basis of instrumental value there could be no gradation of values within the absolute, but every least part would possess an infinite value, no less than the value of the whole, which we are led to suppose is perfection.

It is only when the absolute is interpreted as a standard that the parts are capable of graded evaluation in proportion as they resemble the whole in their completeness. But when the absolute is reduced to a standard in this way, notice how it loses all its concreteness, since all affection and conation have been distilled out. The absolute needs its ambiguities to live by.

opened up the gap we predicted between immediate and standard value.

With the separate fields of ethics, aesthetics, and logic, Bosanquet deals variously. In ethics he takes for granted the immediate values derived from interest and sets over them the standard of organized interests. In general appearance there is no difference between Bosanquet's ethics and Santayana's. The difference is merely one of method of derivation and metaphysical background.

Nor does his treatment of aesthetic value differ greatly from Santayana's. He has a somewhat vaguer differentia of aesthetic pleasure, which all in all seems to resolve itself into capacity or organization believed somehow to be resident in the pleasure itself. And he sets over this as the aesthetic standard, the degree of organization of an aesthetic experience.

In logic, however, Bosanquet makes a serious effort to give recognition to both immediate and standard truth. The subtitle of his *Logic*, "The Morphology of Knowledge," publishes his laudable intention. There are many kinds of judgments variously valuable, and many degrees of truth as knowledge climbs toward the absolute. It is an heroic attempt at the impossible. But in so far as the attempt is in any degree successful, it makes the transition in the wrong direction for Bosanquet's purposes. For it would appear, until Bosanquet enlightens us to the contrary, that absolute truth is derived from relative truths, that it is these fragmentary, imperfect truths that first have value, and that absolute truth is the terminus toward which these converge as a result of their conflicts with one another and the internal drive of value which each possesses. It would seem as if absolute truth derived its value from these original, immediate truths. But Bosanquet hastily cuts us off from this conclusion by his polemic against pragmatism. "The genetic theory [as he dubs pragmatism], so it seems to me, has merely insisted on an arbitrarily limited fragment of the genuine logical theory,"



he writes.<sup>34</sup> The "fragments" one sees, must not be insisted upon, and the morphology of knowledge, whatever else it may be, must not be "genetic." The mere satisfaction of interest in the solution of a problem is not to be regarded as endowing a judgment with truth value. Interests are to have no bearing on truth value, except in one instance. It would appear from one passage that the interest in rationality is the sole drive of thought toward the absolute in "the genuine logical theory." "It [the principle of coherence] is a product of the interest and purpose to explain all that you can; to push the explanation further and further in response to the demand for removal of contradiction in the relative whole of experience at every stage. This interest and purpose is the clue pursued by the effort of judgment from beginning to end. It is the special and distinctive cognitive interest."<sup>35</sup> And these sentences are written to show that "there is no external standard, and, of course, no possibility of applying it if there were."<sup>36</sup> But the reply to these sentences is obvious. Why should the interest in coherence be given precedence over any other interest, such, for instance, as a powerful interest in contrariety, which many of us possess? Santayana tried to bridge the gap in ethics in the same way by a "principle of rationality." And the same question applies here: why be rational? And the only answer there is or can be to this question is not "Just because"; but because coherence is truth and contradiction is confusion; because a standard is set up above the interest in coherence and the interest in picturesque confusion, and all the other interests; and this sanctions the interest in coherence but not the others. Bosanquet does not mean, even though he explicitly says so, that the principle of coherence "is a product of the interest and purpose" in rationality, that the principle derives its value from that interest; what he means is that the interest derives its value from the principle. And

<sup>34</sup> *Logic*, II, 271.

<sup>35</sup> *Op. cit.*, II, 266.

<sup>36</sup> *Op. cit.*, II, 265.

that principle is an external principle. His only chance of making it really immanent was to accept the pragmatic doctrine of truth and build up from that. But that would be contrary to the spirit of his system. He wanted to build down from the absolute. So he started to turn out the whole crew of interests. Then it dawned on him what he was doing, and he grabbed the interest in rationality by the coat tails just as it was fleeing out the door. And he makes this interest serve him in his logic as Kant made "reverence" serve him in his ethics. An interest held under compulsion, however, renders no better service than a man under the same circumstances. Bosanquet's logic, so far as it is consistent, remains as formal and external as Kant's ethics.

So before Bosanquet as before Santayana the gulf yawns between immediate and standard value. It cannot be bridged from the former to the latter nor from the latter to the former. It cannot be bridged at all.

I am afraid the conclusion of this paper is altogether negative. But sometimes a griping cathartic is the first condition of health. I am convinced that the problem of value can be solved only from the point of view of a dualism clearly envisaged at the start, and that it is foolish to despise either side of the division. If immediate value is chaotic, and fragmentary, standard value is merely formal; and if immediate value is rich and impelling, standard value contains all our ideals; and the good, the beautiful, and the true are only three examples among many.

THE PHILOSOPHICAL ASPECTS OF  
THE THEORY OF RELATIVITY

BY  
V. F. LENZEN







2. The ground of physical principles.

3. The significance of physical knowledge.

I shall conclude with some reflections upon theoretical physics and speculative philosophy.

I shall begin with a brief account of the special theory of relativity, which was announced by Einstein in 1905.<sup>2</sup> The special theory may be described as the theory of the relativity of uniform motion. Now motion is change of position with time, position is relative to a reference system. Our first task will be to give an exact meaning to these expressions. Let  $P$  be a point in a plane. The position of  $P$  may be determined with respect to two straight lines,  $Ox$  and  $Oy$ , drawn in the plane at right angles to each other. These rectangular axes are called Cartesian coördinate axes. If  $x$  and  $y$  are the perpendicular distances of  $P$  from the axes  $Oy$  and  $Ox$ , respectively, then  $x$  and  $y$  are called the coördinates of the point. If  $r$  is the distance of  $P$  from the origin of the coördinate axes  $O$ , then we have

$$x^2 + y^2 = r^2.$$

Now let  $P$  trace a curve, so that  $P$  is always the distance  $r$  from  $O$ ; obviously the curve described is a circle. Any point on the circle has coördinates  $x$  and  $y$  and its distance from the center is  $r$ . The relation

$$(1) \quad x^2 + y^2 = r^2$$

holds for all the points on the circle. This equation, therefore, represents the circle, the equation reveals the properties of the circle as well as the diagram. We thus arrive at the notion of a mathematical equation standing for a geometrical figure.

Suppose, now, that I choose another set of axes,  $O'x'$  and  $O'y'$ , parallel to the original axes, but at distances  $b$  and  $a$  from

<sup>2</sup> In the exposition of the special theory I have used especially the two following books by Einstein: *Über die spezielle und die allgemeine Relativitätstheorie* (ed. 9, 1920); *Vier Vorlesungen über Relativitätstheorie* (1922).

$Ox$  and  $Oy$  respectively;  $x'$  and  $y'$  are the coördinates of  $P$  referred to the new axes. We have then

$$\begin{aligned}x &= x' + a \\ y &= y' + b.\end{aligned}$$

Substituting in the first equation, we get

$$\begin{aligned}(x' + a)^2 + (y' + b)^2 &= r^2 \\ (2) \quad x'^2 + y'^2 + 2ax' + 2by' + a^2 + b^2 &= r^2.\end{aligned}$$

This is an equation of the same circle as before, but now referred to the axes  $O'x'$  and  $O'y'$ . It is apparent that this new equation differs in form from equation (1). We are thus introduced to the idea that the form of an equation which represents a geometrical figure depends on the system of axes used. The equations

$$\begin{aligned}x &= x' + a \\ y &= y' + b\end{aligned}$$

are called transformation equations; they transform equation (1) into equation (2).

We have just seen how geometrical figures may be represented by mathematical equations. In essentially the same way physical phenomena and general physical laws are expressed by mathematical equations. Physics, it is true, introduces new quantities in addition to those considered in geometry; our physical equations involve force, mass, time, temperature, electric charge, etc., as well as position. But the situation is exactly similar to that illustrated by the case of the circle. The mathematical equations which express the laws of physics depend in general upon certain coördinate systems. For physical purposes the axes must be attached to some body or system of bodies, like the earth or fixed stars. I shall call such a set of physical coördinate axes a reference system.

We may summarize the discussion by stating that the form of the mathematical equations which express the laws of physics depends, in the first instance, on the system of reference used. An example is the equation which expresses Newton's second

law of motion. Referred to an appropriate rectangular reference system it is

$$F_x = m \frac{d^2x}{dt^2} = ma_x.$$

$F_x$  is the unbalanced force in the  $x$  direction,  $m$  is the mass,  $\frac{d^2x}{dt^2} = a_x$  is the acceleration in the  $x$  direction.

The driving force of the theory of relativity has been the logical demand to formulate the equations of mathematical physics so that their form shall be the same with respect to all reference systems.

Let us first see what classical mechanics contributed toward the realization of this aim. Until the nineteenth century mechanics was the fundamental branch of theoretical physics. The classical mechanics was founded by Galileo and constructed into a system by Newton. Now mechanics is the study of the motion of bodies, and motion is change of position in space with time. Space and time thus constitute the very framework of mechanical phenomena. Newton conceived of space as an infinite, homogeneous, three-dimensional continuum, independent of the objects placed in it. Time he viewed as a one-dimensional continuum, which flowed uniformly and independently of events in time. On the basis of this rigid framework space distances and time lapses were considered absolute. The laws of mechanics were referred to a system of coördinates which was free from rotation and acceleration. Such a reference system is called a Galilean system or an inertial system; relative to an inertial system a body under the action of no forces moves with uniform rectilinear motion. With respect to the way in which the form of the equations of mechanics depends on the reference system employed the two following principles may be announced. The first may be called the principle of relativity of direction. According to this principle all positions of the reference system are equivalent. This first principle deals with the position of the reference system, the second with the motion

of the reference system. The second principle, which may be called the principle of relativity of uniform motion, may be expressed as follows: If  $K$  is an inertial system, then every coördinate system  $K'$  which moves uniformly and without rotation relative to  $K$ , is also an inertial system; the laws of mechanics have the same form relative to all inertial systems. The principle of relativity of uniform motion in classical mechanics registers the fact that by no mechanical experiment performed on an inertial system is it possible to determine its absolute motion. According to Newton then, uniform rectilinear motion is relative, but accelerated motion, including rotation, is absolute.

The nineteenth century witnessed the development of other branches of theoretical physics. Our attention must now turn to electromagnetic theory, in order to see how its rejection of the principle of relativity inspired the special theory of relativity. In order to explain the transmission of light through empty space, physicists had been led to suppose that all space is filled with a medium called the ether. Later light waves were shown to be electromagnetic waves, and all optical and other electromagnetic phenomena were supposed to take place in this ether. For the purposes of electromagnetic theory the ether was held to be stationary. A reference system at rest relative to the ether was considered to occupy a privileged position with respect to the form of the equations of the theory; the form of the equations was different for a reference system moving with uniform motion relative to the ether. This means that the principle of relativity of uniform motion was not supposed to hold for electromagnetic theory. Now the earth was viewed as a reference system moving through the stationary ether. It was to be expected that optical and electrical experiments could be performed on the surface of the earth, such as to enable one to detect the motion of the earth through the ether. All of these experiments failed. Thus, although electromagnetic theory involved the denial of the principle of relativity of uniform



motion, yet the principle of relativity was verified by negative experimental results. On the other hand, the electromagnetic theory of Maxwell and Lorentz made it possible to explain satisfactorily the important facts of optics. It followed from this theory that the velocity of light in a vacuum relative to the ether was a constant. Thus the principle of the constancy of the velocity of light had to be accepted as verified.

Theoretical physics was thus disrupted by a contradiction between fundamental principles. Both the principle of relativity and the principle of the constancy of the velocity of light were supported experimentally. But they were logically incompatible. Special hypotheses were suggested to obviate the difficulties involved, but the antinomy was not satisfactorily settled until Einstein set forth the special theory of relativity in 1905. Einstein solved the contradiction by an analysis of the pre-suppositions underlying the methods of measuring space and time. The classical mechanics had assumed that in changing from one reference system to another measured lengths and times did not change. Einstein showed that space distances and time lapses are relative to the reference system used. This reconstruction of space and time measures made possible the logical reconciliation of the two contradictory principles.

The central problem is the meaning of the simultaneity of two events. The meaning of the simultaneity of two events which occur in the immediate vicinity of the observer is an immediate datum. But the definition of the simultaneity of two events separated in space is not self-evident. The definition must include a procedure for testing the simultaneity. For this purpose Einstein uses light signals, since it had been established that the velocity of light in free space is a constant which is independent of the motion of the source. The following definition of simultaneity may be adopted: "Two events at the points *A* and *B* of system *K* are simultaneous, if they can be seen simultaneously at the mid-point *M* of the line *AB*." It follows as a consequence from this definition that simultaneity

is relative to the reference system used. Two events which are simultaneous relative to one reference system are not simultaneous relative to a reference system in motion with respect to the first. The difference between the classical definition and the relativity definition may be expressed concisely in the following way. According to classical mechanics simultaneity is a dyadic relation, a relation between two terms. According to relativity theory simultaneity is a triadic relation, a relation between three terms. According to the classical theory one would say, "*A* is simultaneous with *B*"; according to relativity theory, "*A* is simultaneous with *B*, with respect to *K*." The considerations which show that simultaneity is relative apply both to time lapses and space distances. Spatial and temporal measurements are thus relative to reference systems and to each other.

By this analysis of the presuppositions underlying space and time measures Einstein was able to show that the principle of relativity and the principle of the constancy of the velocity of light are logically compatible. These two principles, then, were made the postulates of the special theory of relativity. From them follow transformation equations which correlate the space and time measurements relative to coördinate systems in uniform rectilinear motion with respect to each other. These equations, the Lorentz transformation, contradicted the transformation equations of classical mechanics. In order to preserve the unity of theoretical physics, these new transformation equations, which had been discovered with the aid of electromagnetic theory, were made the basis of a non-Newtonian mechanics of which the Newtonian mechanics became a limiting case. It is not of interest to us, however, to pursue this subject.

It remains, in this discussion of the special theory, to mention the contribution of Minkowski. He discovered that the theory of relativity could be formulated with the aid of a four-dimensional geometry. The theory of relativity constrains us to consider the 'point-event' as the element of physical theory.

A point-event occurs somewhere and at some time; to determine it completely four quantities are necessary, three space coördinates and one time coördinate, the four coördinates of the point-event in the four-dimensional space-time continuum. Between two point-events there is an 'interval,' compounded of spatial and temporal separation, which is absolute, that is, it is independent of the reference system. The history of a particle is a succession of events which describe a line, called its world line, in the four-dimensional continuum. The occurrence of two phenomena at the same place and the same time is the intersection of two world lines. Physical observations are records of such intersections or coincidences in four-dimensional space-time.

To sum up: We have seen that the problem of the theory of relativity is due to the fact that, in general, the form of physical equations depends on the choice of reference system, especially upon its motion. The classical mechanics set up the principle of relativity of uniform motion, according to which reference systems which move uniformly and without rotation with respect to each other are equivalent; but this principle was stated only for mechanical phenomena. By a logical development in which classical mechanics was the thesis, electromagnetic theory the antithesis, and the special theory of relativity the synthesis, it was shown that the principle of relativity of uniform motion was applicable to all phenomena. This principle is called by Einstein the special principle of relativity. Its verification was an important step toward the realization of the logical demand that the equations of physics shall have the same form relative to all reference systems.

We are now prepared to consider some of the metaphysical aspects of the theory. It has been claimed that the theory of relativity implies new metaphysical theories of space and time, and it has been held that it proves philosophical relativism, namely, the theory that reality is relative to individual minds.<sup>3</sup> These claims have been based mainly on the special theory, and

<sup>3</sup> H. Wildon Carr, *The General Principle of Relativity* (1920).

may therefore be taken up at this stage of the discussion. I shall next consider, therefore, the two metaphysical topics: the nature of space and time, physical relativism versus philosophical relativism.

My first thesis is that the relativity theory of space and time is not metaphysical. My argument depends upon the view that space and time measures are external relations,<sup>4</sup> that is, they presuppose terms which have the quality of metaphysical space and time. Let us consider length, for example. The physical length of a table is a relation to a standard measuring-rod. When we measure the length of a table we compare it in respect to a given property with some standard. The relation of comparison which is thus set up is external to the terms related and presupposes them. These terms have what may be called intrinsic length. This argument is of course metaphysical, but the opposite course is equally metaphysical, and according to my point of view, less plausible. The theory of relativity shows that physical length, instead of being a dyadic relation between two intrinsic lengths, is a triadic relation between the intrinsic lengths and the reference system used. Now the physicist does not need to know what this intrinsic length is. He can compare objects quantitatively in respect to a given property, without knowing what that property is. The physicist need not investigate the nature of space in order to compare spaces. This distinction between measured length and intrinsic length is recognized by relativists such as Eddington.

The problem of intrinsic length belongs to metaphysics. There are various answers. Is it absolute or relative, a primary or a secondary quality, a form given to the object by the mind, or a confused perception? None of these answers affects physical measures, and physical measures do not affect them. Thus the Neo-Kantians distinguish between pure space and time and empirical space and time; Whitehead has shown that our

<sup>4</sup> For a discussion of external relations the reader is referred to R. B. Perry, *Present Philosophical Tendencies*.



schemas of measurement are constructions derived from elementary experiences; Bergson, in his recent book, has reiterated his distinction between duration and mathematical time. All of these distinctions are sound in so far as they point out that a theory of space and time measurements does not exhaust the problem of space and time. The theory of relativity has made it evident that the measuring relation is a triadic relation, but it conveys no ultimate information about the terms. One may accept the theory of relativity and yet devise various metaphysical theories of space and time.

The foregoing argument may be completed by pointing out that physical relativism does not imply philosophical relativism. In this connection there are four points to be made.

First.—Much emphasis is placed upon the fact that the physical theory implies that each reference system has its own private space and time. To this I reply that transformation equations are given which enable one to pass from one system to another. These equations thus enable one to correlate the judgments of observers using different reference systems.

Second.—Space distances and time lapses depend on the reference system used, but the interval between two point-events in four-dimensional space-time is set up as a new absolute, which is invariant under a transformation.

Third.—The relativity theory of space and time measures makes it possible for the laws of nature to have the same form relative to all reference systems allowed by the theory.

Fourth.—The theory of relativity is a physical theory and in it no reference to mind is made. Philosophical relativism is concerned with the relation between mind and its objects. Physical relativism deals with the relation of objects to a reference system which is itself physical. Both objects and reference system belong to the world of nature. I am not asserting that physical objects are independent of mind. Whether they are or not is of no interest in making physical measurements. As Whitehead says, "nature is closed to mind."

Reference is frequently made to the relativity of space and time to the observer. But the observer can be brought into the field of measurement only by considering him as identical with his body, which is, however, a part of the physical world. The crucial argument against the subjectivistic interpretation of the physical theory is had if we consider two observers fixed to the same reference system.<sup>5</sup> Two observers, at rest near each other on the surface of the earth, have for all practical purposes the same reference system. They have therefore the same space and time. Physical relativism does not exist for them. But all the problems of philosophical relativism will still trouble our two observers. From the physical point of view they will have the same objects with the same dimensions, etc. But philosophical relativism may deny that they have the same object at all. In other words, philosophical relativism must begin where physical relativism leaves off.

I conclude that the theory of relativity does not imply a metaphysical theory of space, time, and reality.

Thus far we have considered only the special theory of relativity, which is limited to reference systems in uniform rectilinear motion. We must now examine the general theory of relativity, which applies to all reference systems, whatever their motion. The motives impelling the generalization of the theory of relativity are well characterized by Thirring, professor of theoretical physics at Vienna. He says:

To proceed with the development of the theory of relativity did not seem absolutely necessary from a physical point of view, but its continuation was carried out by Einstein with unexampled perseverance and consistency during the years 1907–1915. The main motive here at work was Einstein's philosophical [insight]; he saw clearly that even his new theory and, above all, the Newtonian theory of gravitation (accepted without any modification up to that time) still possessed deficiencies of a philosophical nature. . . .<sup>6</sup>

<sup>5</sup> See the article by Thomas Greenwood, *Mind*, n.s., XXXI (1922), p. 205.

<sup>6</sup> J. H. Thirring, *The Ideas of Einstein's Theory*, translated by Rhoda A. B. Russell (1921), p. 93.

Einstein,<sup>7</sup> in his fundamental paper on the foundations of the general theory, presents two arguments, the first, epistemological, the second, physical, in favor of the general theory. The first "*erkenntnistheoretische*" argument was inspired by Mach. Newton had sought to prove that rotation is absolute motion by pointing out that a rotating body is deformed by the centrifugal forces which are called into play by the rotation; for example, owing to its rotation, the earth is flattened at the poles. The appearance of these centrifugal forces alone, without any other visible body being present, enables one to demonstrate that the body is in rotation relative to absolute space. Against this argument Einstein applies the principle of causality. The principle of causality is a proposition about the world of experience; consequently, in the last analysis, causes and effects must be observable. In the Newtonian theory an efficient causality is attributed to absolute space. But absolute space is a pure fiction and hence the explanation of the dynamical effects of rotation as due to rotation relative to absolute space violates the principle of causality. Einstein follows Mach, who attributed the occurrence of centrifugal forces to rotation relative to other masses, i.e. the fixed stars.

In addition to this *schwerwiegende erkenntnistheoretische* argument, Einstein offers the following physical argument. One of the most striking facts in physics is that all bodies fall to the earth with the same acceleration. This is but an example of the general law that in a gravitational field all bodies have the same acceleration. It may also be expressed by the proposition that the inertial mass and gravitational mass of a body are equal. This well verified empirical law is the basis of Einstein's principle of equivalence.

<sup>7</sup> The exposition of the general theory is based upon Einstein's fundamental paper, "*Die Grundlage der allgemeinen Relativitätstheorie*" (1916); and upon the *Vier Vorlesungen*.

The principle of equivalence may now be explained as follows:<sup>8</sup> Relative to a Galilean reference system, that is, a system which is "unaccelerated" and non-rotating, the path of a particle acted upon by no forces is a straight line. If we refer the motion to a coördinate system, accelerated with respect to the first, the path is no longer straight; and the bending of the path is attributable to a field of force which comes into existence as a result of the transformation of axes. This field of force has the property that the deflection produced is independent of the nature of the body acted on, since it is due to a geometrical transformation. Now the same property is shared by the force of gravitation; the acceleration produced by a given gravitational field is independent of the nature or mass of the body acted upon. This fact has led to the hypothesis that gravitation may be of essentially the same nature as the geometrical forces introduced by the choice of coördinates. By this hypothesis, the numerical identity of inertial and gravitational mass is explained as grounded in an identity of nature. The distinction between them depends upon the choice of coördinates. It should be further noted that the principle of equivalence is verified for mechanics, but that its extension to other phenomena is an hypothesis. To summarize: The empirical fact of the numerical identity of inertial and gravitational mass is the basis of the principle of equivalence, which may be stated as follows: A gravitational field of force is exactly equivalent to a field of force introduced by a transformation of the coördinates of reference, so that by no possible experiment can we distinguish between them. The import of this identity is that all reference systems are equivalent for the physical description of phenomena. The principle of equivalence makes it possible to apply the general principle of relativity in formulating the equations of physics.

One more fundamental presupposition of the general theory remains to be noted. It is that for infinitely small four-dimen-

<sup>8</sup> This paragraph is partly adapted from Eddington, *Report on the Relativity Theory of Gravitation* (1920 ed.), p. 19.



sional regions the special theory of relativity applies relative to an appropriate coördinate system. The local system, as it is called, must be chosen so that relative to it there is no gravitational field.

It remains to note some of the consequences of the principle of equivalence which I have been stating. In the first place, it is clear that the carrying out of the theory of relativity leads to a theory of gravitation. A gravitational field can be created by a mere change of the coördinate system. The study of the motion of a body under a change of coördinate systems thus enables one to obtain information about gravitation.

Secondly, Einstein shows that measurements carried out in accelerated systems do not conform to Euclidean geometry. The metrical laws of space and time relative to inertial systems do not apply relative to systems accelerated with respect to an inertial system. By the principle of equivalence the accelerated system may be considered as at rest, but relative to it there is a gravitational field. The metrical laws of a region of the space-time continuum are correlated with its gravitational field. The principle of equivalence thus implies a connection between gravitation and geometry. Matter, which determines the gravitational field of a region, also determines the geometry of the space-time continuum.

In order to give meaning to this statement it is necessary to develop a little more mathematics. The following account is, of course, not offered as a complete and rigorous exposition.

Let us begin by considering a plane, in which I shall draw Cartesian axes,  $Ox_1$  and  $Ox_2$ . Between two points very close together, I shall draw a straight line  $ds$ , called a line-element. I shall now complete a triangle with the line-element as hypotenuse and the other two sides parallel to the two axes,  $dx_1$  and  $dx_2$ . Then

$$ds^2 = dx_1^2 + dx_2^2.$$

I could choose other coördinates, in which case the formula for  $ds^2$  would be different, but other formulae can always

be transformed to the one already given. This equation  $ds^2 = dx_1^2 + dx_2^2$  may be made the basis of plane Euclidean geometry. All the metrical laws of plane Euclidean geometry can be developed from it, so far as they apply to figures in a limited region. Similarly a three-dimensional Euclidean geometry can be built upon

$$ds^2 = dx_1^2 + dx_2^2 + dx_3^2$$

and a four-dimensional geometry can be built upon

$$ds^2 = dx_1^2 + dx_2^2 + dx_3^2 + dx_4^2.$$

Let us now turn to curved surfaces. On such surfaces one cannot draw rectangular axes, but it is possible to draw a system of curved lines, which may be numbered appropriately. Coördinates relative to such axes are called Gaussian coördinates, after the mathematician Gauss, who introduced them in 1827. A short line-element on the surface, which can be treated as straight, may now be expressed by the formula

$$ds^2 = g_{11}dx_1^2 + 2g_{12}dx_1dx_2 + g_{22}dx_2^2,$$

where the  $g$ 's are functions of  $x_1$  and  $x_2$ . This formula characterizes the metrical laws of the curved surface just as

$$ds^2 = dx_1^2 + dx_2^2$$

characterizes Euclidean plane geometry. The  $g$ 's depend upon the coördinate system employed and upon the nature of the surface. The Euclidean plane has the property that a coördinate system may be chosen so that the  $g$ 's become equal to 1 or 0, that is, the formula for the line-element in a Euclidean plane, or any other surface into which it may be deformed without stretching, may be transformed into

$$ds^2 = dx_1^2 + dx_2^2.$$

In general, however, the  $g$ 's cannot be transformed into Euclidean values, but are functions of the coördinates. Thus the general geometry of a surface, which may be viewed as a two-dimensional space, is based upon the formula

$$ds^2 = g_{11}dx_1^2 + 2g_{12}dx_1dx_2 + g_{22}dx_2^2.$$

Now Riemann extended the theory to  $n$ -dimensional manifolds. The metrical properties of such manifolds are determined by

$$ds^2 = \Sigma_{i,k} g_{ik} dx_i dx_k$$

where the symbol  $\Sigma$  indicates an appropriate summation. After Helmholtz, this formula is called the generalized Pythagorean theorem.

This transition from Euclidean to Riemannian geometry is the mathematical correlate of the development from the concept of action at a distance to the concept of field in physics.<sup>9</sup> The fundamental fact of Euclidean geometry is the Pythagorean theorem, that the square of the distance between two points is a quadratic form of the relative coördinates of the two points. In Riemann's geometry this proposition is assumed to be strictly valid only if the two points are infinitely close together. The transition from Euclidean '*Fern*'-*Geometrie* to Riemannian '*Nahe*'-*Geometrie* corresponds to the transition from a physics which is based upon the concept of action at a distance to a *Nahewirkungs-Physik*, a physics based upon the concept of field. The impelling motive of both a field physics and Riemannian geometry has been the desire to understand the world by a consideration of its differential properties. The concept of field introduced into electromagnetic theory by Faraday receives in the general theory of relativity its systematic application to gravitation. The geometry of classical mechanics and the special theory of relativity is Euclidean or pseudo-Euclidean. The geometry of the general theory of relativity, which is a systematic field physics, is that of Gauss and Riemann.

In the general theory of relativity the object of investigation is a  $3 + 1$  dimensional space-time continuum in which a point-event is determined by Gaussian coördinates  $x_1, x_2, x_3, x_4$ . Now, in the classical mechanics and the special theory of relativity, the coördinates of a point-event have an immediate physical significance: they denote quantitative measures which are deter-

<sup>9</sup> H. Weyl, *Raum-Zeit-Materie* (ed. 4, 1921), p. 81.

minable by comparison with a standard measuring rod or a standard clock. But in the space-time continuum of the general theory,  $x_1, x_2, x_3, x_4$  are mere numbers. The metrical properties of the space-time continuum are defined at any point,  $x_1, x_2, x_3, x_4$ , by

$$ds^2 = g_{11}dx_1^2 + g_{22}dx_2^2 + g_{33}dx_3^2 + g_{44}dx_4^2 + \dots$$

Altogether there are ten  $g$ 's, which are called the components of the metrical fundamental tensor. But it has been stated that geometry and gravitation are interrelated: the  $g$ 's are also the components of the potential of a gravitational field. Thus the  $g$ 's determine the geometry of a region; they also determine the gravitational field.

The central thought of the theory may now be set forth. It is that the geometry of the space-time continuum of a region in which there is a gravitational field is not Euclidean; it is the geometry of a four-dimensional manifold with variable curvature. The  $g$ 's define the curvature, also the gravitational field. The law of gravitation, or rather, the field equations of gravitation, define the  $g$ 's in terms of the distribution of matter. We may summarize the foregoing discussion by saying that physics is reduced to geometry.

But there is still another point to be considered. The general theory of relativity demands that the equations of physics be unchanged in form by a transformation of coördinates. But since physics is reduced to geometry, the path to the realization of the principle of relativity is by way of those analytical expressions of geometry, which are unchanged in form by a transformation of coördinates. Now the geometry of a manifold is determined by the formula for the line element

$$ds^2 = \sum_{i,k} g_{ik} dx_i dx_k$$

The mathematical problem, therefore, consists in finding for a manifold defined by this generalized Pythagorean theorem, those analytical expressions which are identical for all systems of coördinates. The analytical theory may be called the theory of invariants of quadratic differential forms. It was built into a



system by two Italian mathematicians, Ricci and Levi-Civita, who called it the absolute differential calculus. The fundamental structures in this branch of mathematics are tensors, the components of which depend on the coördinate system. Tensors have this property: if the components vanish in one coördinate system, they vanish in all systems. If a natural law is expressed by equations in which the components of a tensor are put equal to zero, it follows that the form of the equations is unchanged by a transformation of coördinates; the equations are then said to be general covariant equations. The most general form of the general principle of relativity may then be expressed by the statement that the laws of physics must be expressed by tensor equations, that is, they must be covariant with respect to any transformation of the coördinates  $x_1 \dots x_4$ . With the aid of the theory of tensors Einstein was able to complete the general theory of relativity.

But we are probably now ready to look at the fundamental equations to which the theory of relativity has led. I shall presently state the equations which constitute the synthesis of mechanics and gravitation.

But first of all I must define another term. You are all familiar with the straight line of plane Euclidean geometry. It may be defined as the shortest distance between two points. On a curved surface we are not able to draw straight lines; the line corresponding to the Euclidean straight line is called a geodesic line; for example, on the surface of a sphere the geodesic lines are great circles. Now, in relativity geometry the geodesic lines are the longest lines. We have also learned that a particle describes a world line in the four-dimensional space-time continuum.

Einstein's law of motion may now be expressed: The world line of a particle moving freely in a gravitational field is a geodesic line. The equation of motion is

$$(1) \delta \int ds = 0 \quad \text{or} \quad \frac{d^2 x_i}{ds^2} + \Gamma_{\alpha\beta}^i \frac{dx_\alpha}{ds} \frac{dx_\beta}{ds} = 0 \quad (i = 1, 2, 3, 4).$$

This corresponds to Newton's first law of motion. The second set of equations defines the curvature of our space-time world in terms of the distribution of matter. It is

$$(2) \quad R_{\iota\kappa} - \frac{1}{2}g_{\iota\kappa} R = -\mu T_{\iota\kappa} \quad (\iota, \kappa=1, 2, 3, 4).$$

This set of equations corresponds to Poisson's equation for the Newtonian potential function. It reduces to

$$(3) \quad R_{\iota\kappa}=0$$

in empty space. The symbols  $R, R_{\iota\kappa}$  and  $\Gamma^{\iota}_{\alpha\beta}$  are functions of the  $g$ 's and their derivatives, which occur in the theory of invariants. The symbol  $T_{\iota\kappa}$  denotes the impulse-energy tensor of matter;  $\mu$  is a constant. These two equations constitute the unified theory of mechanics and gravitation. The gravitational equations include the fundamental principle of conservation of energy and of momentum.

Suppose that there is no gravitational field. Certain expressions vanish, space-time becomes pseudo-Euclidean, that is, a coördinate system may be chosen so that the  $g$ 's become equal to  $\pm 1$  or 0, and we have Newton's first law of motion stated thus: The world line of a particle acted upon by no forces is a straight line.

Suppose that the gravitational field is constant, that the mechanical velocities are small compared with that of light, and that the deviation from the geometry of the special theory is small. Then we get Newton's inverse square law of gravitation as a first approximation.

It remains to note that these equations, which have been set up with the aid of the absolute differential calculus, are not changed by a transformation of coördinates. They are covariant with respect to all transformations of Gaussian coördinates. Einstein has thus arrived at a set of general covariant equations for mechanics and gravitation.

It should be added that Einstein has also developed some cosmological ideas which lead to the view that the universe is finite, that the world is a closed world analogous to the surface

of a sphere. These speculations have led to a generalization of the field equations of gravitation.

In the discussion of the special theory of relativity it was seen that the special theory was based upon two postulates: first, the special principle of relativity; second, the principle of the constancy of the velocity of light in a vacuum. What, now, is to be said about the fundamental principles of the general theory? Einstein, himself, has most clearly set forth the bases of his theory.<sup>10</sup> They are three:

First.—The general principle of relativity, according to which natural laws are to be expressed in general covariant equations. In accordance with suggestions by E. B. Wilson, Pauli and others I think it best to call this principle the principle of covariance.

Second.—The principle of equivalence, the principle that the field of force due to a transformation of axes is equivalent in its physical effects to a gravitational field. This principle is a generalization from the empirical proportionality between mass and weight. It is applied with the help of results obtained from the special theory.

Third.—Mach's principle, the principle that the metrical properties of space are wholly determined by the masses of bodies. This is a generalization of Mach's demand that inertia be reduced to reciprocal action between bodies.

The general theory contains the Newtonian theory as a first approximation; in three cases experimentally determinable discrepancies from Newton's theory have been predicted. The great attractiveness of the theory of relativity, however, resides in the originality of its conceptions, its magnificent structure, its synthetic unity.

It remains to note that Weyl and Eddington have generalized Riemann's geometry, so that electromagnetism is united with gravitation and mechanics in a new synthesis. This has inspired Weyl to exclaim, "The dream of Descartes of a purely geo-

<sup>10</sup> *Annalen der Physik*, Folge 4, LV (1918), p. 241.

metrical physics seems to be proceeding to a wonderful fulfillment, although in a manner not foreseen by him."<sup>11</sup>

But the physical and logical part of the discussion is now completed. The remainder of the paper will be devoted to philosophical problems. I do not believe that the general theory of relativity gives rise to metaphysical issues which differ in principle from those discussed in connection with the special theory. Hence the general conclusion with respect to the metaphysical issues is that the theory of relativity has no implications concerning the ultimate nature of space, time, and reality. It remains therefore to discuss what light the theory of relativity throws upon the nature of exact scientific knowledge and truth. This is the subject-matter of theory of knowledge, or epistemology.

It must be understood, however, that I am not proposing to discuss epistemological problems systematically. For example, I ignore entirely the problem of the nature of perception; my discussion will be restricted to problems pertaining to physics as a significant structure grounded in principles. My aim will be to offer some reflections on the philosophy of theoretical physics under the topics: degrees of scientific truth, the ground of physical principles, and the significance of physical knowledge.

One of the characteristics of the recent progress of theoretical physics is that, in general, new concepts and principles do not require the abandonment of the older theories. The earlier theories occur in the later as limiting cases. This may be illustrated by numerous examples, but I shall confine myself to the theory of relativity. Thus Newton's theory is a limiting case of the special theory, the special theory is a limiting case of the general theory. This aspect of the development of physical thought seems to me to be best described by the Hegelian principle that the truth of the lower stages is preserved in that of the later stages of development.

<sup>11</sup> *Op. cit.*, p. 258.



The second topic I have entitled the ground of physical principles. The most striking problem which this subject brings to mind is that of *a priori* elements in knowledge. The center of this discussion is Kant's critical philosophy; for Kant was the philosopher of the Newtonian mechanics, and it is of interest to determine how a revision of mechanics affects the philosophy based upon it. To my mind the best epistemological discussions of relativity have approached the subject from the Kantian point of view. I may mention, for example, the writings of Ilse Schneider,<sup>12</sup> Reichenbach,<sup>13</sup> and especially Cassirer.<sup>14</sup> I must not here dwell on these discussions, except to remark that the Neo-Kantians are interpreting relativity from their point of view with considerable success. Of interest is the judgment of a distinguished theoretical physicist, von Laue. In his book on the general theory of relativity he says:<sup>15</sup> "One of the marks of a correct theory of knowledge is that it is invariant with respect to changes of physical theory. We will not conceal our conviction that Kant's critical philosophy satisfies this condition with respect to the theory of relativity, though every statement in the *Critique of Pure Reason* may not be true." Even more striking is the position of Eddington.<sup>16</sup> He has advanced the view that most of theoretical physics consists of laws which do not govern the course of events in the objective world, but which are automatically imposed by the mind in selecting what it considers to be substances. And he says: "We have found that where science has progressed the farthest, the mind has but regained from nature that which the mind has put into nature."

My own view is that there are two principles, which seem to occupy a unique position in the system of theoretical physics.

<sup>12</sup> Ilse Schneider, *Das Raum-Zeit-Problem bei Kant und Einstein* (1921).

<sup>13</sup> H. Reichenbach, *Relativitätstheorie und Erkenntnis a priori* (1920).

<sup>14</sup> E. Cassirer, *Zur Einsteinschen Relativitätstheorie* (1921).

<sup>15</sup> M. von Laue, *Die Relativitätstheorie*, II (1921), p. 42.

<sup>16</sup> Eddington, *Space, Time and Gravitation* (1921), p. 200.

They are the principle of unity and the principle of covariance. The principles of unity and covariance seem to possess a different status from that of the principles of mechanics, electrodynamics, and thermodynamics. Einstein notes this, when he states, in effect, that the principle of covariance is a formal principle. Now a principle such as the principle of covariance has what may be called an *a priori* use. For example, suppose a physical theory is set up and one wishes to test it. It should be examined for covariance; and empirical predictions should be tested experimentally. The principles of unity and covariance are canons grounded in the structure of reason. Borrowing a phrase from Kant, I shall call them ideals of reason.

Lastly, I wish to consider the significance of physical knowledge. First of all it is necessary to evaluate Mach's theory that the end of scientific knowledge is economy of thought. Science is but an economical method of thinking about the neutral data revealed to us by sensation. Atoms and molecules, to use Mach's phrase, are but mechanical mythology, fictions which enable us to economize thought. According to the disciples of Mach the theory of relativity is one of the most brilliant achievements of the application of the principle of economy.

It is impossible to discuss this doctrine in detail; to oppose it I can do no better than quote the argument of Planck, the originator of the quantum theory, which rivals relativity theory in originality and exceeds it in influence upon physical investigation. In an article<sup>17</sup> devoted to Mach's theory of knowledge Planck says, "The principle of economy is of no use in physical investigation, simply because one can never foresee from what standpoint economy is to be best obtained and preserved. The physicist, therefore, if he wishes to advance his science must be a realist, that is he must seek the permanent, the unchangeable, in the flux of appearances, that which is independent of human senses. The economy of thought is a means, not an end."

<sup>17</sup> *Vierteljahrsschrift für wissenschaftliche Philosophie*, XXXIV (1910), p. 506.

The theory of relativity is a great step toward the achievement of the goal described by Planck. It is true that space and time measures, force, acceleration, etc., are shown to be relative to reference systems. But this relativization is but a means to achieve a greater generality and objectivity of physical laws—that is, universality. Planck says, “We may say that the characteristic feature of the actual development of the system of theoretical physics is an ever extending emancipation from the anthropomorphic elements, which has for its object the most complete separation possible of the system of physics and the individual personality of the physicist.”<sup>18</sup>

This ideal is achieved by the theory of relativity. Against Petzoldt,<sup>19</sup> who claims that the theory of relativity is a reassertion of the doctrine of Protagoras, I wish to enumerate the outstanding absolute or objective features of the theory.

First: The interval between two point-events close together in four-dimensional space-time is absolute, that is, invariant with respect to all transformations; it is the same for all observers. The geodesic line between two distant point-events has an absolute significance.

Second: Physical observations can be expressed in terms of coincidences in four-dimensional space-time, that is, in terms of intersections of world lines. Let us imagine that the world lines are like strings embedded in a jelly. The jelly may be deformed and yet the intersections of the world lines are not affected. Mathematically, this means that we can make any transformation of coördinates that we please. Thus particular physical propositions about intersections of world lines are objective.

Third: The general equations of physics are covariant with respect to all transformations of Gaussian coördinates; they are the same for all observers.

<sup>18</sup> M. Planck, *Eight Lectures on Theoretical Physics*, translated by A. P. Wills (1915), lecture 1.

<sup>19</sup> J. Petzoldt, *Das Weltproblem* (ed. 2, 1912), p. 203.

I can perhaps reinforce my interpretation of relativity by citing the opinion of Sommerfeld. In his lecture<sup>20</sup> on relativity theory he says:

One ought not to interpret the meaning of the word relativity as if all phenomena depend on the point of view of the observer, as if everything were subjective. Indeed, it is just the change in point of view which permits the appearance of natural law in its unchangeable form. The theory of relativity has not merely a negative, destructive aspect, it has above all a positive, constructive aspect. The positive problem of the theory was to set forth the order of natural law, which, like a rock of Gibraltar, stands out against the changing phenomenal forms of space and time, to be viewed by all whose vision is aided by the telescopic power of mathematics. The clearing away of all metaphysical, unobservable absolutes was a great service of the new theory. But a still greater service was the setting up of that which is valid and permanent for, and independent of, all points of view and all reference systems. . . .

This is just the difference between Mach and Einstein, one the forerunner, and the other who realized the idea of relativity. Mach's interest was directed to the negative aspects of relativity. He sought to clear away the presupposition of an absolute space and time which obstructed the vision of reality. But while engaged in this useful work, he lost his belief in the invariance of the laws of nature. . . . This theory is called positivism by Mach's successors, although its service consists in the negation of the unobservable. Einstein thinks otherwise. The negation of the metaphysical is for him merely a means to attain to the highest assertion of the laws of nature, to their invariant validity, independent of every point of view. It is characteristic that the positivists enthusiastically praise Einstein, the destroyer, but will not recognize the other Einstein, the builder.

The world today is in an unsettled state; inherited standards and institutions seem to be in process of dissolution. There seems to be, to use Lord Haldane's phrase, a reign of relativity. But one must not think that physics is to be included in this disintegrating movement. Classical physics is not crumbling under the assaults of Einstein. Brilliant additions have been made to its superstructure, separate parts have been brought into relation upon a deeper basis. The very strength of the theory of relativity is that Newton's theory applies to all but a few special phenomena. The classical physics is interpreted, but its truth conserved. I can offer no better argument than the

<sup>20</sup> A. Sommerfeld, *Relativitätstheorie* (1921).



statement of Einstein<sup>21</sup> himself. He says: "No one must think that Newton's great creation can be overthrown in any real sense by this or by any other theory. His clear and wide ideas will forever retain their significance as the foundation on which our modern conceptions of physics have been built."

I am afraid that there has been a serious misreading of the theory of relativity on account of the word 'relativity.' But we have seen that relativity is really but a means to a greater generality and objectivity of physical laws. I think that a better name for the theory is the theory of the covariance of the equations of mathematical physics. However, if one is going to be influenced by words, why not take one's cue from the mathematics of relativity, the absolute differential calculus? "Absolute mechanics" seems to be an appropriate description of the new system of physics which unifies mechanics and gravitation.

Dr. Schiller has said that the fundamental issue in philosophy is that between Plato and Protagoras. It appears to me that Plato's logical realism has been brilliantly exemplified by the achievement of Einstein.

Let me summarize what appear to me to be the high lights in the foregoing discussion of theory of knowledge. I have not sought to analyze theoretical physics from the standpoint of a single system, but rather to suggest fragmentary insights. The Platonic conception of an over-individual order of universal truth; the Cartesian conception of a rational science of nature; the Kantian conception of a science of principles moulded by ideals of reason; the Hegelian conception of a development of thought, in which the truth of the earlier stages is conserved in the later—these are philosophic insights which appear to me to be exemplified in current theoretical physics.

At the beginning of this paper I implied that we were going to study the influence of the theory of relativity on philosophy. But, as I have shown, the theory itself has been influenced by

<sup>21</sup> This quotation is from Einstein's brief article which appeared in the *London Times*; it is reprinted in Slosson's *Easy Lessons in Einstein* (1921).

philosophical considerations. Weyl, who has contributed greatly to the later development of relativity, says that the theory of relativity is the joint product of philosophy, mathematics, and physics.<sup>22</sup> Indeed, the foundations of theoretical physics are undergoing a philosophical reconstruction at the present time. Theoretical physicists are displaying a lively interest in logic and theory of knowledge, in the critical work of Hume, Kant, and John Stuart Mill; of Helmholtz, Mach, and Poincaré. But they are also inspired by that faith in the power of reason which is a heritage from the classical rationalists. Starting from but a minimum of empirical material, guided by principles of the highest generality, with the use of generalized mathematical reasoning and "*Gedankenexperimente*," theoretical physicists are constructing stately systems. And so I would leave with you this final thought. As one follows the work of the great contemporary theoretical physicists, of whom Einstein is only the most brilliant, one cannot help but be moved by such a splendid revelation of the power of speculative reason.

<sup>22</sup> *Op. cit.*, p. 2.

THE METAPHYSICS OF  
CRITICAL REALISM

BY  
J. LOEWENBERG





# THE METAPHYSICS OF CRITICAL REALISM

J. LOEWENBERG

What Lovejoy has called the "anomaly of knowledge" has recently been subjected to fresh analysis by a group of writers united together by a doctrine which they concur in naming Critical Realism. The name of this doctrine is significant, expressing generic kinship with other types and forms of realistic belief, but denoting specific divergence from them by the adjective 'critical.' In Critical Realism we have an important philosophic proclamation earnestly affirming an old faith, but modifying it radically by the addition of new elements that seem to have had their setting elsewhere. Whether the 'realistic' and the 'critical' parts of the doctrine form at all a happy union, the captious may well feel to be a matter of serious doubt. For the 'critical' partner to this union may easily sever his bonds and transfer his allegiance to other mates.

What is the significance of the word 'critical' in this special version of realism? The dictum of one of its protagonists that "we must appreciate subjectivism and yet be realists,"<sup>1</sup> expresses tersely the difference between a realism accepted *naïvely* and one taken *critically*. A realism genuinely critical, believed in *cum grano salis*, as it were, is one which terminates in the candid recognition of a precarious factor perennially present in human knowledge. But for this precarious factor there would be nothing anomalous about cognition. What is anomalous about it is the demand which we naïvely make that the cognitive experience as a fugitive event in the mental career of an individual mind or organism should get out of its skin, so to say, and report truly the nature of objects enjoying an

<sup>1</sup> R. W. Sellars in *Essays in Critical Realism* (1921), p. 190.

independent existence outside it. Externality in some sense the *objects* of knowledge must obviously be endowed with to differentiate knowing from dreaming or imagining; and without describing the *act* of knowledge as a temporal occurrence in the life of a mind or an organism it is difficult to see what intelligible meaning the word knowledge could possibly convey. No knowledge without human experience the precariousness of which is the root of error; and no knowledge without external objects the integrity of which is the source of truth: such is the cognitive situation stated generally. But the matter is not allowed to remain so simple. When sufficiently probed by a dialectical process of scrutiny the cognitive situation discloses a chasm between inner idea and outer fact—between subject and object—to bridge which many theories of knowledge have been designed. That the initial and necessary dualism between subject and object is not ultimate, and must therefore be overcome, is the contention of those monistic theories of knowledge which form the polemical background for Critical Realism. The distinction between things and ideas may be reduced to a difference between orders and degrees of an identical existence, so that objects and the multifarious shadows of them in countless minds may be seen under the form of a monistic reality, composed *either* of mental stuff *or* of simple entities—physical, logical, or neutral. With the disappearance of the dualism, however, the cognitive situation as we human beings concretely experience it, as a union of mental and non-mental elements or processes, would appear to vanish also. Against facile theories, such as Lockian or Berkeleyan subjectivism and neo-realistic objectivism, which by their monistic and atomic accounts do violence to the complexities of human knowledge, Critical Realism raises its voice in deliberate protest.<sup>2</sup> It

<sup>2</sup> "The critical realist is able to avoid the difficulties about perception and error which . . . render neo-realism altogether untenable, and at the same time escape from the falsely subjective Lockian view that we perceive only our perceptions and are thus imprisoned within our ideas." J. B. Pratt in *op. cit.*, p. 97.

attempts a fresh scrutiny of the problem of knowledge, seeking to restore and to vindicate the belief of common sense in our cognitive experiences as mental events holding commerce with trans-subjective things. The zealous attempt of Critical Realism to confound its naïve brethren by justifying our innocent faith in an external world, which our fallible ideas may confidently approach and apprehend, constitutes one of the occasional instances of the irony of fate.

While the intention of Critical Realism is to humanize knowledge by rendering it fallible without undermining the integrity of the external world, the analysis by which knowledge is shown to be 'critical' and its objects 'realistic' is not a little circuitous. To begin with, Critical Realism, as contrasted with other accounts, requires for its statement of the cognitive situation what Montague has called "the epistemological triangle"—emphasized in varying degrees by nearly all the critical realists—namely, the outer object, the conscious organism, and the datum of knowledge.<sup>3</sup> This triangulation of the sphere of knowledge suggests what is perhaps most specific about this new doctrine. The data of knowledge, according to it, must not be confused with the objects of knowledge, so that there is never a guaranty, in the moment of apprehension, that the data are the characters of any outer existence.<sup>4</sup> A sharp distinction must be drawn between object and content, "between that which I intend and the particular mental state by which I intend it."<sup>5</sup> The legitimacy of this distinction for perception where content and object appear as if they were fused, Critical Realism demonstrates by an appeal to more complex experiences in which the difference may be more readily admitted. Consider, for instance, the ordinary experiences of reminiscence and anticipation. The mind that recollects a past event or anticipates a future occurrence operates by means of present data and processes which

<sup>3</sup> *Op. cit.*, pp. 8, 91, 141, 198, 224 note.

<sup>4</sup> *Op. cit.*, p. 20.

<sup>5</sup> *Op. cit.*, p. 102.

refer to objects or situations now irrevocable or prospective. In either case the mind aims through its immediate content at a distant and objective target: here the 'triangular' pattern envisaged by Critical Realism is on the face of it quite evident. To be sure, the possibility of such apprehension depends upon the assumption that the past or the future object and my present recollection or anticipation of it share certain qualities or characters—the different critical realists designate them with varying and fluctuating denotation as "essences"—yet even in common parlance, essential similarity—whatever it may turn out to be—is not the same as existential identity. My present recollection of Beethoven's Fifth Symphony, for example, consists of data and contents which numerically at least are quite distinct from those constituting the actual occurrence in a particular spatio-temporal context; despite their numerical difference, however, the later experience cannot function as a substitute or echo of the earlier without many qualities and characters being common to both. Now this "inter-temporal cognition, the reference of one moment's experience to that of another moment,"<sup>6</sup> is a typical instance of what is involved in knowledge as such, as seen by the critical realists; and this instance is typical because most of them actually make their appeal to such inter-temporal cognition to illustrate the difference so crucial for their doctrine between 'object' and 'content.' All knowledge, be it perceptual or conceptual, is thus mediate and representative. The external objects are as such never reached directly: they require mediation or representation by means of given and present contents functioning as their symbols or deputies and existentially distinguishable from them. And the contents of the mind can perform their appointed task of symbolizing or representing outer existents only because of a sort of pre-established harmony in character and quality between the external object and the representative idea. Thus a harmony of essence between existentially disparate events is here a necessary assumption. Critical

<sup>6</sup> A. O. Lovejoy, in *op. cit.*, p. 53.



Realism, in Santayana's language, "is the union of two instinctive assumptions, necessary to the validity of knowledge: first, that knowledge is *transitive*, so that self-existing things may become the chosen objects of a mind that identifies and indicates them; second, that knowledge is *relevant*, so that the thing indicated may have at least some of the qualities that the mind attributes to it."<sup>7</sup>

It is this dualism between self-existing things and the data or contents of the mind, yet capable of representing them, that makes necessary the introduction of those mysterious "essences," the *dei ex machina*, without whose aid neither true nor false-cognition could be accounted for. These essences parading under various synonyms, such as qualities, character-complexes, character-traits, logical entities, logical universals, and being thus radically different from the "copies" of older representative theories, are indispensable as links between independent outer objects and their counterparts in cognition. Assume the possibility of such essences with their identity unimpaired inhabiting two separate regions, living a double life, as it were, and the contention that valid knowledge must satisfy the seemingly contrary demands for relevancy and transitivity loses its paradoxical character. Valid knowledge is relevant if its datum exhibits some identity of essence with the outer object to which it refers; and it is transitive if, and only if, the datum is a mere "vision of the real thing"<sup>8</sup> if, in a word, the identity of essence is not mistaken for identity of existence. "To what degree transcendence and relevance are achieved in particular instances," in what manner "the proportion of these two necessary ingredients" may vary, "as knowledge is addressed to various kinds of objects,"<sup>9</sup> such and similar questions I must leave untouched and confine myself to an analysis of but one of the requirements which valid knowledge must satisfy, the requirement for transitivity or transcendence.

<sup>7</sup> *Op. cit.*, p. 168.

<sup>8</sup> C. A. Strong, in *op. cit.*, p. 244.

<sup>9</sup> G. Santayana, in *op. cit.*, p. 169.

The notion of transcendence repeatedly employed by all the critical realists appears to cover two distinct ideas. In the first place, transcendence is used by them as a strictly epistemological concept, and as such seems to denote nothing more than the trans-subjective character of knowledge, its persistent and irresistible reference to an external world. This sort of transcendence, in fact, is what makes them all co-believers in the same realistic faith. It is implied in their initial distinction between data of knowledge and objects of knowledge. The latter necessarily transcend, i.e., lie beyond the former. Without transcendence the data themselves might easily usurp the prerogatives of objects. But this external reference is viewed as a mere tendency inherent in the cognitive process, and no assurance is given that the tendency may not simply be an innate or instinctive prejudice. It is significant that for Critical Realism the external world is not a matter of inference, but rather an affair of attribution, or affirmation, or compulsion. All these expressions or their equivalents occur in their appropriate contexts. The right to believe in the existence of an external world is for most critical realists far from inalienable. Not all of them have Santayana's engaging candor in speaking of such belief as a "leap," who, in fact, distinguishes between two leaps: the leap of intuition and the leap of faith and of action.<sup>10</sup> It is curious that such leaps, however coercive, whether of intuition or of action, should be considered a satisfactory ground for a belief in the existence of an external world. The appeal to instinct is no more convincing. From a doctrine which bears upon its face the aspect "critical" an appeal to our instinctive faiths comes with a certain shock. The instinctive belief in the existence of the world about us is indeed, as one of the writers puts it, "pragmatically justifiable."<sup>11</sup> We find that it works. And everything looks as if it were true. But is this pragmatic belief, however potent instinctively, a sufficient warrant for the truth of philosophic realism? Moreover, are we so sure of the unity

<sup>10</sup> *Op. cit.*, p. 183.<sup>11</sup> *Op. cit.*, p. 5.

and the harmony of our countless instinctive beliefs? May not a study of them reveal incompatible differences? And could not an instinctive or innate tendency be discovered for a — genuine doubt in the existence of an external world? We know too little about our instincts to assert, as one of the critical realists confidently does assert, that "the postulate of knowledge has its foundation in our instinctive assignments."<sup>12</sup> The truth of the matter is that the critical realist is in the position of the proverbial child: he wants his essences and he wants his existents too. He wants to confine knowledge to characters capable of being held before the mind (as Rogers defines these baffling essences),<sup>13</sup> and he wants also an external world independent of the mind in which these essences may or may not have an existential habitat. The logic of this situation forces him to seek in the essences, which are the only data the mind has, transcendence as a necessary ingredient. Not in entire forgetfulness, and not in utter nakedness, but trailing clouds of a transcendent reality do these essences appear before the mind. It is a case of the familiar attempt, repeatedly made in the history of philosophy, to compel the 'what' to yield a 'that.'<sup>14</sup> In this particular use of transcendence by Critical Realism we seem to have a faint suggestion of the famous ontological argument. Only, it is not argument. It is ontological faith.

But transcendence denotes not merely this transitive ingredient in the cognitive process, it is not solely a property of ideas, it connotes also a specific character or quality possessed in their own right by the independent existents themselves; transcendence, in short, has a metaphysical signification. Of real external objects Critical Realism says little more than that their 'self-existence' must be affirmed, because the data which represent them contain a coercive outer reference. But what of the real nature of these objects? Shyly almost in a whisper

<sup>12</sup> R. W. Sellars, in *op. cit.*, p. 198.

<sup>13</sup> *Op. cit.*, p. 157.

<sup>14</sup> On the 'what' and the 'that' in Critical Realism see B. Bosanquet, *The Meeting of Extremes in Contemporary Philosophy* (1921), chap. 7.

we are told that that is their own affair. The external existents are what they are; they do not get within our consciousness; their nature is private and incommunicable.<sup>15</sup> That the essences of which our data consist constitute also the inner nature of things we have no way of ascertaining. Ultimate reality exceeds our grasp. That there is such a reality we are compelled to affirm: is it not vouchsafed by the act of transcendence discovered in all cognition? But *what* it is, our data of knowledge do not permit us to assert with confidence: it simply is transcendent. The *act* of transcendence—the ‘leap’ of which Santayana speaks—performed by every form of human cognition must thus be sharply distinguished from the *state* of being transcendent enjoyed by a world of existents which as such remains unaffected by this act. In Critical Realism, however, the meaning of transcendence as an act or power of the mind and the meaning of it as a state or mode of being, capable of logical discrimination and separate application, seem to be indissolubly joined together. Epistemological transcendence need not necessarily involve metaphysical transcendence. In absolute idealism, for instance, the act of transcendence involved in normal apprehension does not lead to the conception of a transcendent reality. Every object of thought, to quote Bosanquet, “is transcendent of immediate experience.”<sup>16</sup> But transcendence of immediacy is for him not the same as transcendence of experience. The former he regards as of necessity inherent in the character of thought; the latter he views as untenable and as involving a contradiction in terms. For Critical Realism, however, a radical distinction between transcendence of immediacy and transcendence of experience, such as Bosanquet regards as indispensable for absolute idealism, cannot legitimately be made. To grant the validity of it would be tantamount to a surrender of a realistic position. The type of realism here under discussion is therefore not merely epistemological,

<sup>15</sup> *Essays in Critical Realism*, p. 24.

<sup>16</sup> *The Meeting of Extremes in Contemporary Philosophy*, p. 145.



it is also metaphysical. It is at once a warrant for the act of transcendence inherent in all forms of human cognition, and a defense of the necessity for a transcendent realm where real objects may enjoy an existence undisturbed by human experience. Transcendence as a cognitive function and transcendence as an ontological category must in a consistent Critical Realism imply each other. Because knowledge deals with "essences" and never with "existents," a transcending tendency toward the latter must necessarily be sought in the cognitive process itself to give it objective reference; and because "existents" enjoy in their own right a transcendent mode of being which the "essences" constituting the data of knowledge may or may not adequately symbolize, cognition is always destined to be mediate or representative, and therefore liable to error and failure. Thus, the representative theory of knowledge advocated by Critical Realism begets of necessity a transcendent metaphysics which in turn engenders a representative theory of knowledge.

Of this circular situation which the double meaning of transcendence entails the authors of Critical Realism seemed to be so little aware that they thought it possible to isolate the problem of knowledge and to agree on a solution of it while holding "different ontological views."<sup>17</sup> One writer, for instance, feels quite free to assert that Critical Realism "does not pretend to be metaphysics. It is perfectly possible for the critical realist to be a panpsychist, a metaphysical dualist, a Platonist, or an ontological idealist of some other type."<sup>18</sup> (The choice of these metaphysical types is not accidental: adherents to them may as a matter of fact be found amongst the very propounders of Critical Realism.) Yet the confession is immediately made that "only so much of the metaphysical problem need critical realists be agreed upon as is required by the epistemological doctrine which they hold in common."<sup>19</sup> But

<sup>17</sup> *Essays in Critical Realism*, p. vii.

<sup>18</sup> J. B. Pratt, in *op. cit.*, p. 109.

<sup>19</sup> J. B. Pratt, in *op. cit.*, p. 109.

for the epistemological doctrine propounded by them to have any meaning at all nothing less is required than a transcendent metaphysics which, it can be shown, constitutes a type of ontology not interchangeable with any of the types enumerated in the passage just quoted. That a definite theory of knowledge is harmonious with any ontology is an illusion that can be easily dispelled. For there is no merit in a theory of knowledge as such unless its congruity with reality can be demonstrated; the argument in its favor, therefore, always presupposes a definite metaphysics. *Mutatis mutandis*, the reason for holding that a certain ontology is cogent is bound up with the belief in the exclusive adequacy of a certain theory of knowledge. Epistemological preferences cannot be divorced from anterior metaphysical choices, nor metaphysical predilections from their prior epistemological affinities. Bergson's theory of intuition in relation to his metaphysics of change may be cited as a typical instance of the circular situation I am here alluding to. Whence the belief in the cognitive superiority of intuition, and whence the faith in the ontological supremacy of change? Is the intuitive method to be given preference over the analytical because of the advantages it enjoys in taking possession of a reality in continual flux; or is the belief in such a reality inescapable because no other can be sustained by intuition to which somehow belongs the distinction of being the only true mode of knowledge? Obviously, the disparagement of the analytical and the eulogy of the intuitive method depend upon the anterior belief in an incessantly changing reality: it is Bergson's ontology which renders intelligible at once his attack on analysis and his defense of intuition. And it is equally obvious that the argument for the assertion that the essence of reality is mobility or duration—if Bergson may be said anywhere to stoop to argument—rests upon an absolute vision or intuition the validity of which consists in its ability to dispense with "expression, translation, or symbolic representation:"<sup>20</sup> it is Bergson's theory of

<sup>20</sup> *An Introduction to Metaphysics*, translated by T. E. Hulme, p. 9.

knowledge, in short, which impels the rejection of a static and the avowal of a dynamic metaphysics. Thus ancillary to each other are in Bergson's philosophy intuition and duration. Here is a case of reasoning in a circle, inevitable as Royce says, "in dealing with all philosophic concepts of a fundamental nature,"<sup>21</sup> and one from which more than one inference might be drawn concerning the nature and significance of philosophic thinking. From this circular situation—whatever interpretation it may ultimately favor—no philosophy, so far as I can see, is able to escape, and Critical Realism is no exception. The kind of representative theory of knowledge it advocates and the transcendent type of reality to which alone such a theory is relevant are bound each to each by mutual implications.

The last statement, however, must be received with caution. Inevitable as the circular relationship between a representative theory of knowledge (such as Critical Realism sponsors) and a transcendent ontology seems to be, there is a difference in implications resulting from emphasizing the logical priority of one or the other. The various critical realists, as a matter of fact, deliberately lay stress upon what they choose to call the "knowledge-situation," which, they hold, when submitted to a rigorous analysis, discloses a tripartite pattern—mind, essence, object. The last member of this trinity is founded not on a postulate or an inference but on a compelling act of affirmation discoverable in the cognitive experience itself. This affirmation may or may not be justified,<sup>22</sup> the possibility always being open that to the bare essences which alone constitute the data of the

<sup>21</sup> "The Principles of Logic," in *The Encyclopedia of the Philosophic Sciences: Logic* (1913), p. 106.

<sup>22</sup> "Since on our view the mind's object is not its content, illusion may be taken for perception and error for knowledge, and the ultimate nature of reality in itself may be very difficult, or even impossible to discover." J. B. Pratt, in *op. cit.*, p. 104.

"There are in the knowledge-situation not two factors, but three—mind, logical essence, and real object; the cognitive recognition of the object being, not the bare essence, but the combination of this with a further "affirmation" or act of reference to an independent real—an act which may or may not be justified." A. K. Rogers, in *op. cit.*, p. 141.

mind no existents may actually correspond. The *act* of reference to a reality independent of the mind and its essences must be accepted as a sufficient basis for the *belief* in the existence of a transcendent realm. This act of transcendence is, however, no absolutely valid act: of the ultimate nature of reality we can have no infallible certitude. Hence the note of skepticism so striking and emphatic whenever the critical realists address themselves to the metaphysical issue. This skepticism is ineluctable. The cognitive situation being *ex hypothesi* insulated from the ontological, it can yield nothing more than a veil of essences through which, as through a glass darkly, shadowy outlines may be discerned, intimating, perhaps spuriously, the transcendent abode of outer existents. From these essences, from the "mind's cage-door," to which cognition is confined, the passage to a real world is difficult and uncertain; and one wonders whether the skepticism which the epistemology of Critical Realism entails may not in the end do irreparable injury to the 'realistic' aspect of this doctrine. Merely on the basis of its 'critical' analysis of knowledge the external world may be viewed as owing its existence to the creative act of transcendence which the mind feels constrained to perform in every experience of cognition. Without this act and this power of transcendence—an act or power of the *mind*, be it remembered—no external or transcendent world. To 'deduce,' in the manner of Fichte and his followers, a world of being from the creative power of the mind to transcend itself, is one of the speculative possibilities. It would take little dialectical skill, in fact, to turn critical realism into voluntaristic idealism, if the "knowledge-situation" alone is emphasized. The isolation of knowledge, in the form of mere *Wissenschaftslehre*, means the isolation of mind, and such isolation may easily lead to an apotheosis of mind.

But different are the implications when, beginning at the other end, a transcendent ontology is regarded as having logical priority, a representative theory of knowledge being necessitated



by the coercive pressure from a realm of independent existents. It is one thing to pass from an act of transcendence to a world of independent beings; and it is quite another to justify transitive knowledge in the face of a transcendent type of reality. The demand imperiously made by every form of realism is the demand that cognition should conform to existent beings outside it and independent of it. It is not the cognitive experience that endows external reality with its substance and character; it is the nature of outer existence—whatever substance and character it may possess—which prescribes to knowledge its scope and content, and which shapes its course and destiny. But for this dependence upon an external world, knowledge would be indistinguishable from winged fancy, free like her to roam and wander in every direction. It is precisely this want of freedom to move without external restraint that characterizes the specifically cognitive experience. No, knowledge is not free. It is subject to a sovereign master. Exacted from it is nothing less than absolute submission to an independent universe the real nature of which it may patiently and humbly explore but not make or control. All this, I take it, constitutes part of the meaning associated with philosophic realism, and essential also to the type calling itself “critical.” A new and cardinal feature of Critical Realism, however, is the contention that a realistic universe requires a representative theory of knowledge of a certain kind. Beginning, not with essences as data of the mind, but with the notion of an independent reality which these essences may or may not truly symbolize, Critical Realism arrives at a skepticism which cleaves to knowledge rather than to existence. Not the external world but the adequacy of our cognition may now be doubted. The predicates ‘transcendent’ and ‘representative’ assume from this point of view a relationship less perplexing than the one they have in the isolated “knowledge-situation.” “Transcendence” in this new context denotes the self-existence, self-sufficiency, aloofness, indifference of a real universe, undisturbed by our cognitive efforts to grasp it, and perhaps ultimately

discrepant with the results of such efforts. Knowledge of reality thus remote, not to say inaccessible, must perforce be dubious. We may indeed have "representations" of it, but who or what shall guarantee their accuracy? The burden which is thus laid on knowledge is heavy: its representations—indirect, hazardous, and fallible—are always open to the assaults of skepticism. How to establish their truth is a crucial and momentous question. The problem of error—such a stumbling block to the acceptance of neo-realism—is for Critical Realism therefore genuine and central. The preoccupation with it on the part of its authors is not accidental. The possibility of perpetual error is embedded in the very nature of representative cognition. In what the truth of our representations shall consist is on the basis of this doctrine no easy matter to settle, but there is at any rate no difficulty in assuming them all erroneous. Representative and indirect knowledge—the only sort of knowledge appropriate for a transcendent mode of being—issues from the womb of doubt and finally returns to it. Metaphysical realism is vindicated, but the "knowledge-situation" is critical with a vengeance! All is well with reality, it is our cognition that is precarious.

Thus the double meaning of transcendence—as an act of mind and as a mode of being—on which Critical Realism appears to depend for its articulate expression discloses upon analysis a dialectical situation of great philosophic importance. Transcendent reality and representative cognition here imply each other by a circular relationship, a relationship, moreover, from which no ontology and no epistemology may be said to be immune. But circular though the relationship is, it matters greatly at which end we make our start. If we begin with our cognition and resort to the act of transcendence involved in it as a demonstration of the truth of philosophic realism, the result may not be realism at all. Skepticism and idealism alike may be countenanced by this act. The act of transcendence is an act of mind and may leave us, therefore, profoundly in doubt about the existence of an external world altogether, or it may lead us

to divest it of its independence and to deduce its ultimate nature from the internal meaning of that act. Whereas if we begin not with what we know but with a realistic world the transcendent nature of which necessitates representative cognition, we may discover reasons—to be adduced later—why our ideas are fallible and precarious, and why a certain skepticism must always permeate human knowledge, however prodigious its results and protean its products. In pretending to insulate the “knowledge-situation,” and in emphasizing the mind’s power of transcendence as a basis for a belief in an external reality, Critical Realism begins at the wrong end and comes very near to jeopardizing its realistic thesis. But it cannot afford to jeopardize this thesis; for in so doing it exposes to danger its doctrine of cognition as well. The possibility of knowledge being of the representative or transitive kind is bound up with the anterior ontological belief in the necessary existence of outer objects in independence of apprehension. I do not see what meaning the word ‘representative’ could possibly convey without this ontological belief. One can neither enter nor leave Critical Realism without a metaphysical bias. There can be for it neither a problem of truth nor a problem of error without raising the metaphysical issue. And, despite much dodging and equivocation, the “knowledge-situation” as analyzed and formulated by it presupposes, in fact, the validity of nothing less than a metaphysical realism of the transcendent type.

But this metaphysical realism, it will be said, is an assumption exacted by the logical or practical exigencies of the cognitive situation. It is merely a methodological device. Outer existence or transcendence is a term in a triadic relation, and its assumption would be gratuitous if it did not serve to throw light on the problem of knowledge. It is a *Hilfsbegriff*. By assuming the existence of transcendent objects, so the critical realist may be supposed to argue, we can succeed in describing more adequately and in rendering more intelligibly a specific area of problems. Epistemology, to be true to its name, is nothing but a theory

of knowledge, and is not responsible for the metaphysical implications of the facts it finds and of the categories it uses any more than the science of physics is accountable for the ultimate meaning of the concepts (such as time, space, matter, motion) it of necessity employs. The critical realist, in the words of Pratt, "simply writes down transcendence as one of the facts of the world, just as the physicist writes down X-rays as a special sort of fact."<sup>23</sup> Epistemology like any science addresses itself to specific facts; the adequacy of its procedure must be tested with reference to its self-imposed limitations and by its own chosen methods. There is nothing new in the isolation of a group of facts; it is sanctioned by scientific usage; and in confining itself to the "knowledge-situation" as such, epistemology is doing no more than what every respectable science has always regarded as a matter of course. Outer existence or transcendence has to be understood, therefore, as a fact or as a concept pertinent to a special field of investigation—the field of cognition—without prejudice to its other relevant uses in different contexts. Just as space may mean one thing for the physicist and another for the metaphysician, so transcendence may have one sense as an epistemological and quite another as an ontological concept.

This line of argument in favor of restricting the meaning of transcendence may be reinforced by another. It is reminiscent of Kant. Transcendence, we have found, is tainted with skepticism as soon as it is made to serve metaphysical interests. If transcendence is interpreted as an act of mind peculiar to the cognitive experience as such, and as being the sole basis for our belief in the existence of the external world, doubt in the rational validity of this act inevitably assails and overwhelms us. For all we know there may be no such external world at all, the act affirming it, being a mental propensity, may perhaps be explained on subjective grounds. On the other hand, if transcendence is used as defining a mode or state of being, characterizing the self-sufficiency and remoteness of real existents, doubt in the possi-

<sup>23</sup> *Op. cit.*, p. 97.



bility of our representative knowledge, by means of its imperfect vehicles, ever reaching such distant and foreign objects cannot be easily dispelled. The polyglot and illusive ideas through which knowledge operates are not fitted for such a task. The skepticism attaching to either alternative, to the possibility of transcendent objects actually existing or to the possibility of knowledge grasping them if they do exist, Critical Realism may cite as an argument in favor of confining the term transcendence to a methodological use in the analysis of the cognitive situation. The category of transcendence performs a scientific function in a definite context limiting its scope; as such it is free from those difficulties and contradictions which an illegitimate extension of its meaning inevitably produces. The distinction between the scientific or the methodological and the metaphysical or the ultimate denotation and employment of concepts is a familiar distinction. It is one Kant made use of in the solution of his antinomies. The concept cause, for instance, though riddled with contradictions when construed in behalf of cosmology, is appropriate enough for methodological purposes. So, too, the antinomies involved in transcendence may perhaps be resolved by maintaining a distinction the effect of which is to silence metaphysical criticism and to give scientific license to ambiguities and inconsistencies.

This is not the place to discuss the grave issues which the traditional dichotomy between science and metaphysics is bound to raise. It is a topic to which obviously justice cannot be done in a few incidental remarks. But I cannot refrain from recording my regret that to this artificial cleavage is due much of the superciliousness characteristic of positive science and complacent metaphysics in their allusions to each other. The connection of science with what metaphysics seeks and finds is indeed but attenuated if science is to cling to particular empirical facts, and, eschewing speculation concerning their ultimate nature and destiny, is to confine itself to a description of their external relations and uniform laws, capable of quantitative statement

and experimental proof. This Comtian tradition of the scope of science—a tradition that drew not a little sustenance from the philosophy of Kant and from that of his successors—has had a twofold consequence. In the votaries of science, as thus circumscribed, it has engendered contempt for metaphysics. What is not empirical and inductive is stigmatized as ideological and fruitless speculation to be regarded as having little or no relevancy to the slow and toilsome accretions of scientific knowledge. The sweeping generalizations of metaphysics defy scientific methodology and hence may with impunity be neglected or ignored. The metaphysicians, on the other hand, especially those with absolutistic proclivities, have felt prone to return the compliment by assuming a patronizing attitude toward the work of science, or by condemning its fruits as frail probabilities and fragile abstractions that can neither assail nor vindicate those existential judgments pertaining, not to this or to that particular region of facts, but to being as a whole and to reality as such. Traditional metaphysics with its predilections for being in its ultimate and pervasive sense, operating by means of methods that are speculative, dialectical, or deductive, and aiming at judgments that are universal and indubitable, pretends that it can soar to greater heights, from which the work of science—minute, fragmentary, uncertain—looks insignificant and impertinent. In the face of such pretensions the anti-metaphysical bias of science, however lamentable, is intelligible enough; but more deplorable and less justifiable is the anti-scientific habit of mind bred and fostered by certain types of metaphysics.

That modern science is intrinsically alien to metaphysics is a gross error. Science permits, strange as it may sound to say it, a comprehensive ontological generalization with reference to the universe as a whole. Its very lack of finality, the very skepticism which science begets and perpetuates, involves, as we shall see, a metaphysics at once realistic and transcendent. Of this, and its connection with the notion of transcendence as

employed by Critical Realism, the following pages seek to give but a brief suggestion.<sup>24</sup>

It must be made clear, first of all, that the nature of scientific knowledge need not be bound up with a special theory of perception. One of the chief defects in Critical Realism is a confusion between perceptual and scientific modes of apprehension. To describe the nature of scientific knowledge without endowing the mind with a certain power of transcendence is indeed difficult, if not impossible; but the description of scientific knowledge as transitive may be made to accord with any theory of perception, including a presentative one, simply because scientific knowledge is not identical with perceptual awareness. Santayana, some years before he identified himself with Critical Realism, acknowledged this by saying that "perception is originally true as a signal, but false as a description; and to reach a truer description of the object we must appeal to intelligence and to hypothesis, imagining and thinking what the effective import of our data may be."<sup>25</sup> What the difference is between perception and science—whether one of kind or degree—is a problem of great importance. It is one of the problems, for example, which enters into Kant's distinction, concerning the exact nature of which commentators are not in agreement, between the Analytic of *Concepts* and the Analytic of *Principles*. Whatever its solution, it is certainly hazardous to assume, as the critical realists appear to assume, that the "knowledge-situation" as encountered in perception and as envisaged by science is the same. We cannot say with assurance and without a profounder investigation of the problem whether the analysis of scientific knowledge may require terms

<sup>24</sup> In the analysis that follows of the implications of the scientific method with special reference to Critical Realism, I am elaborating, but with considerable modification, the ideas sketched in a paper on "The Metaphysics of Modern Skepticism," read before the American Philosophical Association at its meeting in New York City in December, 1922, and printed in *The Philosophical Review* for May, 1923. Occasional repetition of sentence or phrase seemed unavoidable.

<sup>25</sup> "Literal and Symbolic Knowledge," *The Journal of Philosophy, Psychology and Scientific Methods*, XV, no. 16 (August 1, 1918), p. 440.

and presuppositions like, or unlike those needed for the analysis of ordinary experience of the perceptual sort.

But that scientific knowledge involves transcendence is obvious enough. Science, in fact, to speak very generally, depends upon two different though related ideas of transcendence. One has to do with the nature of hypothesis and the other with the nature of discovery. The logic of hypothesis is in a very profound sense one of suspicion. The insistence upon continual verification of any scientific statement, without which its claim upon our credibility may always be disputed, impugns, not the personal veracity of the individual scientist who makes it, but rather the powers and capacities of human observation and reasoning as such. Hypotheses are often so spurious that to assume them at the outset to be partially erroneous is always part—and the chief part—of scientific wisdom. Every hypothesis is thus under compulsion of being purged of the suspicion with which it is initially—and inevitably—received. And it is this element of suspicion that renders continual transcendence necessary, transcendence meaning conscious reference and constant appeal to an external world of facts which alone is able through a gradual disclosure of its objective nature to decide the destiny of the suspected hypothesis. Without this act and this power of transcendence hypotheses would be nothing but fanciful conjectures and useless as vehicles of genuine investigation. But obviously no hypothesis can do more than ‘represent’ or ‘symbolize’ the external relations and the objective affinities that constitute the groups of facts to which it addresses itself; and this representative or symbolic character renders the career of every hypothesis precarious and fallible. It can never dispense with an appeal to a transcendent world of facts for more complete confirmation; I say transcendent because such a world is supposed to contain an inexhaustible supply of facts, for the insatiable demands of verification.

This inexhaustible source of facts—the objective world science investigates—satisfies also the passionate demand for



discovery. The postulate of discovery is certainly one of the most important of scientific postulates involving the conception of an unknown reality which, when sufficiently gauged, may disclose properties and structures quite unlike those which characterize the known. The spirit of science is thus everywhere prepared to find facts and situations inconsistent with our most established theories: it assiduously and methodically looks for the new and the unsuspected. From the point of view of scientific discovery, the world is still full of strange and unsounded seas shrouding within their depths dark and uncertain treasures. The possibility of finding the hitherto undiscovered, an assumption no science can dispense with, suggests, however, two important implications. One implication is that the difference between verified and unverified hypotheses is one of degree. In the face of new possibilities as yet unfathomed our present knowledge may have to suffer radical revision. As long as the new and the surprising may everywhere be looked for, no final prediction of the nature of things would seem to be permissible. Finality is a word utterly incongruous with the postulate of discovery. The indefatigable invasion of unexplored regions may lead to endless detection of novel facts and situations in the light of which our most cherished theories may fall into desuetude. The logic of discovery is therefore such as to render all our assertions about the world, however well-established and accredited for the present, hypothetical and problematic. The other implication is an ontological one. Discovery is impossible without the assumption of an objective world so complicated and so recondite as to require interminable trials and endless experiments with it. The popular and much abused word 'research' is certainly suggestive. Scientific activity means a seeking and a searching without end; it means the pursuit of an ideal which is essentially unrealizable:

Miles and miles distant though the last line be,  
 And though thy soul sail leagues and leagues beyond,—  
 Still, leagues beyond these leagues, there is more sea.

These lines of Rossetti's accurately symbolize the limitless nature of scientific exploration: its end—the exhaustive account of all that reality is and encompasses—is obviously an infinite task. That there is no limit to discovery is a proposition which must be taken literally. Discovery is thus a self-transcendent activity operating in a transcendent universe, for a reality so aloof and so enigmatic as to require endless investigation—endless in a temporal as well as a logical sense—is transcendent with a vengeance! It is thus, then, that scientific knowledge, depending as it does upon hypotheses and discoveries, involves transcendence in the sense in which Critical Realism employs it, and which, with more or less ingenuity, it artificially injects into perception.

Now the element of suspicion so essential to the nature of hypotheses, and one which impels the need for their incessant verification, and the opposite element of trust so necessary for the possibility of discovery are, despite their psychological differences, related parts of a unitary attitude in the presence of a transcendent reality. It is the transcendent character of reality which condemns our hypotheses to perpetual peregrination in quest of relevant facts and which incites our minds to look for the new and the surprising with hope and with confidence. Doubt in the adequacy of our cognitive possessions and hope in the possibility of enlarging them without end depend upon a transcendent ontology for their articulate expression. The skepticism which gnaws at every scientific generalization and the faith which inspires every scientific discovery, bound each to each like Siamese twins, find their rationale in a metaphysical judgment anterior to them.

This metaphysical judgment may be expressed by the proposition that reality is problematic. The ontological generalization that reality is problematic, which is the starting point of scientific inquiry, without which, in fact, no inquiry could get its initiation, is also its conclusion. The conclusion differs from the initiation not in quality or character but in complexity and

profundity. That this is so can be shown—here but imperfectly—by viewing the term problem as something objective and ultimate. From an existential point of view to define a thing as a problem is to attribute to it a real character just as much as if one defined it in terms of all sorts of ‘entities’—mental, physical, logical, neutral. The real character of a problem consists in its nature to challenge the perspicacity of minds. Whatever exists, exists as a problem, in the sense of compelling the release of an infinite activity of investigation. To say this is to say something metaphysically ultimate about our world and consistent with our empirical and scientific experience. The universality of this statement cannot be readily challenged without admitting its validity, simply because the denotation of the term problem permits of many orders or dimensions, in one of which the challenge itself would have to be included. Let me suggest, then, the multi-dimensional character of the term problem. That all things may as such appear universally problematic is obvious enough: they are capable of being so experienced as regards their nature, meaning, and destiny. There is hardly a thing so self-luminous as to eliminate the experience of wonder about it. Nothing, be it ever so commonplace, can, when you stop to think about it, fail to impress us with its enigmatic character. We are deeply indebted to the Romantic Movement in the nineteenth century for the perspicuous insight that the things which the Philistines take for granted may be full of wonder and mystery. It is not merely the surds of sense that are puzzling in their positiveness, as Santayana correctly remarks, “but also the surds of logic—the axioms, categories, Platonic ideas, relations, or laws that are employed in any particular discourse. What is similarity? What is duration? What is space? What is existence?”<sup>26</sup> To be sure, things are at times sufficiently weary, stale, flat, and unprofitable to inspire little wonder about them; and this is so not because they are transparent or palpable but because our

<sup>26</sup> *Ibid.*, p. 432.

minds are dull and our hearts heavy. To imagination and reflection all things appear bathed in a sea of mystery. This is one order or dimension of problems. But not only are things as such baffling to those who seek their ultimate *raison d'être*; their solutions proffered by science and refined by philosophy are themselves problematic on a higher level. For however cogent the grounds, empirical or logical, on which the adequacy or the truth of our theories in any field of inquiry may be said to rest, there is always the question, at bottom unanswerable, in how far these theories may lay claim to uniqueness or exclusiveness. Any solution is after all nothing more than the original problem seen in a certain perspective and in a certain context. Whether from the point of view of another perspective and another context the original problem would not necessitate a different interpretation, is itself a problem not touched by the solution in question. Every solution, however satisfying for the moment and however great its prestige amongst the experts, is fundamentally problematic for the sole reason that its adequacy is always open to doubt in the light of the still unexplored and unexhausted facts to which it is relevant and of which it is prophetic. So all solutions, if we be but thoroughgoing in our inquiry, must leave us profoundly discontented until the issue as to their uniqueness or exclusiveness is finally settled. And can that ever come to pass? But there is yet another level on which the problematic character of things is found to stare us in the face. Even those solutions in the sole adequacy of which we have satisfactory grounds for believing have a way of producing out of their own nature new and unforeseen issues. The movement in any given field of problems appears to be one of self-acceleration. Every discovery which for a time sheds light on questions hitherto puzzling brings in its train a host of novel data and perplexing consequences without adequate interpretation of which all inquiry remains but incipient and fragmentary. Thus ubiquitous and many-dimensional is the



term problem; its pervasive nature, may it not find fitting expression in the words of Emerson's Brahma:

They reckon ill who leave me out;  
When me they fly I am the wings?

It seems to emerge inviolate on higher and higher levels. Thus the logical framework and hierarchy for the never-ending work of science (and perhaps of philosophy as well) may be said to be contained in the following three propositions: (1) Whatever exists, exists as a problem; (2) the solutions of problems, however adequate, are themselves problematic; (3) the solutions of problems, however satisfactorily they may succeed in terminating discussion concerning those questions of fact or of theory that generated them, possess endless fecundity in raising new problematic issues profoundly modifying the original questions. It is from this point of view that the real world must be designated as 'transcendent,' transcendent in this case meaning nothing more than the fact that on every level of inquiry problems always outrun their solutions. And the world of science, in particular, with its hypotheses and discoveries, has its genesis and termination in this comprehensive metaphysical generalization.

It must be noted, however, that the relation between the metaphysics of science and its transitive methods of inquiry is of necessity a circular one. The postulate of a universe perennially problematic and the knowledge of it by means of hazardous hypotheses and felicitous discoveries mutually imply each other. Here, too, the "knowledge-situation" points to and is sustained by its appropriate ontology, while the metaphysics of science presupposes the adequacy of modes of apprehension congruous with it. It is by means of the transcendent vehicles of scientific investigation that the infinite nature of things becomes progressively uncovered. In the limitless power of self-transcendence, inherent in the nature of hypotheses and discoveries, may be found the source for a coercive belief in a

problematic universe. The passage from knowledge to reality is legitimate in science no less than in any other "universe of discourse." Yet the relation between knowledge and reality in the reverse order and direction must be accorded equal significance for the instruments of scientific operations to have objective validity. The anterior belief in a transcendent reality, a reality impervious and inexhaustible, renders necessary the inductive struggles and the experimental ventures with it. The immense pressure of objective problems dictates and controls scientific methodology. Under the stress of an independent and perpetually problematic universe, to be forever sounded and explored, science achieves its methods and perfects its technique, grows in scope and multiplies in results. Thus, it is the cognitive operations of science that require a problematic reality for their self-transcending activity; and it is precisely such a reality that in turn begets and fashions the very instruments and vehicles of scientific knowledge. We have here once more a case of circularity. Circular though the situation unavoidably is, it matters very greatly, as it does in other instances of philosophic circularity, which aspect is emphasized and given priority. The emphasis upon the priority of the cognitive situation in science, with its perpetually self-transcending hypotheses and discoveries, may lead to a subjectivistic conception of knowledge and an agnostic view of reality. Scientific theories, laws, and formulae, what are they, from the point of view of the human mind contriving them, but useful *Denkmittel*, mental constructs or transcripts of the uncertain and chaotic flux of things? This, if I err not, is the gist of Schiller's "Humanism" and of William James's "Pragmatism."<sup>27</sup> Whereas, if we lay stress primarily not on the human processes of knowledge but rather on that to which they address themselves—an independent realm of eternal problems—the conception of a 'realistic' ontology and a 'critical' epistemology must be the resulting philosophy. It is the meta-

<sup>27</sup> See the seventh lecture in W. James, *Pragmatism*, entitled, "Pragmatism and Humanism."

physical conception of an independent reality ultimately problematic that forbids scientific generalizations the enjoyment of undisturbed validity, yet ever tantalizes the human spirit with rewards for its intellectual travail and with promises of richer comprehension.

This superficial excursion into a field so vast and so intricate as that of the presuppositions and implications of science would be inexcusable were it not for the fact that this field may be made to yield sufficient instances exemplifying some of the tenets of Critical Realism, but not in the sense intended by their several protagonists. A certain type of Critical Realism is not untenable. But this type—primarily metaphysical—must not be confused with the views of those who profess it, any more than a true pragmatism, according to Lovejoy, should be confused with the opinions of those who style themselves pragmatists. At the close of his essay on “Pragmatism *versus* the Pragmatist” Lovejoy ventures to suggest in outline what a consistent pragmatism ought to be (it ought to be, in fact, nothing else than Lovejoy’s own rendering of Critical Realism), saying that “it would, perhaps, be too sanguine to hope that this essay may serve to convert some pragmatists to pragmatism.” I feel equally dubious with regard to the possibility of convincing critical realists that their versions of Critical Realism may be but aberrations of it. None the less Lovejoy’s attempt to rescue an important doctrine from its false prophets has much merit in it, for, let the prophets say what they will, it is after all the doctrine that matters.

Now Critical Realism is a very felicitous name for a certain type of philosophy in which the term ‘transcendence,’ despite its equivocal meanings, is indispensable. Denoting now an act or power of the mind and now a mode or state of being, it serves to bring out clearly the circularity in which metaphysics and epistemology are of necessity involved in their dependence upon one another; and it also serves to connote more or less definitely in what sense such a philosophy may be ‘critical’ and in what

sense it may be 'realistic.' The fallacies and ambiguities of which the different critical realists are guilty may be traced to their sole emphasis upon the act of transcendence and to their feigned indifference to the metaphysical issue. The result of such undue emphasis is to render their realism so very critical, not to say precarious, as to call into question its legitimacy. So much hinges upon (assuming all its suggested meanings to be clear) what precisely the ambiguous little word *critical* is a predicate of. What exactly does it qualify? Is reality critical, or is it knowledge that is critical? And if knowledge, is it so because of incurable defects and infirmities inherent in it, or because what it seeks to enter or to surround is beyond its direct and complete reach? The latter alternative I take to be the essence of a consistent and cogent Critical Realism, that Critical Realism which science may be made to exemplify. Scientific knowledge is indeed in a perennially 'critical' state, not because it is characterized by ineptitude or impotence, but rather because it seeks to encompass and penetrate a 'realistic' universe of infinite depth and expanse. It is a 'realistic' ontology that renders scientific cognition 'critical.' The passage is here as elsewhere—circular. But only on the prior realistic assumption of an independent and inexhaustible universe can the 'criticism' of the adequacy or the truth of our human assertions about it have any relevancy or significance. Critical Realism properly understood coincides thus with a philosophy of science—a philosophy in which there is union and not strife between the realistic and the critical components. It teaches metaphysically that reality is infinite and transcendent, and *consequently* that our knowledge of such a reality, despite its prodigious acts and powers of self-transcendence, being human, shares in all the illusions, errors, and failures to which the flesh is everlastingly heir.



WHITEHEAD'S PHILOSOPHY  
OF NATURE

BY  
NORMAN KEMP SMITH



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The examination of Whitehead's philosophy of nature must be a coöperative task in which mathematicians, physicists, and philosophers take their respective shares. Owing to my ignorance of mathematics and of physics, there is much in his works in regard to which I am unable to form any competent opinion. On the other hand, there is also much which is likely to be almost equally puzzling to those who are innocent of philosophy; and it is to these latter portions of his teaching, in so far as they can in any degree be separately dealt with, that I shall confine my attention.

Whitehead's teaching, on its critical side, is directed to showing that the fundamental concepts usually employed in the physical sciences rest on certain assumptions which may seem to have behind them the prestige of science, but which really have been foisted upon science, partly through the influence of mental habits acquired under the stress of practical needs, and partly through the influence of speculative doctrines that obtained currency among the early Greek thinkers, and that have held the field ever since. As language has also been moulded in terms of the dominant ways of thinking, it too plays an important part in the maintenance of these false views.

Happily, science does not depend, for its fruitful development, upon the successful elaboration of a philosophy of nature. The experimental verification of hypothetical deductions, especially when the verification is by means of the most precise quantitative measurements, keeps the working scientist upon the path to truth, or else warns him when he has strayed therefrom. And since he very rightly lays comparatively little stress

upon the logical perfection of his procedure, he holds somewhat loosely to his fundamental concepts, modifying them freely, in this or that regard, as need arises. By such hand to mouth methods, he can usually, in a sufficiently satisfactory manner, meet all the immediate needs, both practical and theoretical. There can be little question, however, that fundamental concepts and postulates do exercise considerable influence; they certainly do so, when, as in philosophy, we endeavor to envisage nature in its broader features, and in its relation to the purposes of human life.

The account which Whitehead gives of what may be called the traditional or classical philosophy of nature, that is, of the view of nature which underlies the Newtonian physics, is as follows. The physicist ordinarily regards himself as concerned with the adventures of material entities in space and time, and accordingly has interpreted the course of nature as being the history of matter. More particularly defined, the attitude is this: the physicist conceives himself as perceiving the attributes of things, and the things which have these attributes as being bits of matter. He further conceives these bits of matter as capable only of moving in space; and so has come to believe that a complete description of the aggregations and motions of which they are capable would constitute an adequate solution of all the problems with which natural science has to deal.

But in carrying out this theory it was found that bits of matter, i.e., corpuseles or atoms, do not suffice to account for all the phenomena, and the concept of ether had therefore to be introduced. Ether is, however, Whitehead maintains, only the conception of matter over again. It too is conceived as occupying space, and its constituent parts are again regarded as capable only of motion. It is matter attenuated into what are supposed to be its sole indispensable properties. As Lord Salisbury has remarked, ether would appear to be simply the substantive of the verb to undulate. The minimal requirements for the possibility of undulation are space, and as involved in



the conception of motion a something, which need not otherwise be discriminable from nothing—a something that moves. Ether is not, therefore, a new type of entity, but merely a re-dressing up of that matter whose deficiencies it is supposed to make good.

Whitehead formulates an alternative to this philosophy of nature. In place of the substantial, material entities, persisting through time and moving in space, he would substitute as being the ultimate components of reality, a very different kind of entities; and these he would describe as being events. Nature, he declares, is at each moment an all-comprehensive event within which we discriminate constituent events; and behind the notion of an event we cannot penetrate by any amount of analysis. Analysis of an event at most only reveals within it still other events of smaller duration; it does not enable us to resolve the notion of an event, in the alleged manner of the traditional physics, into an abiding substance and its merely transitory states. Events are the ultimate constituents of reality; and it is in terms of them that we must explain all those appearances of permanence and of abiding structure which are no less characteristic of nature than is its transitoriness. The permanences in nature are in all cases conditioned by events, and cannot, therefore, be employed to render events more intelligible than they already are when conceived simply as events.

As already suggested, events, as experienced or known, are never limited to the instantaneous present. Like a melody, they have duration, and within this duration, we can always discriminate constituent events of shorter duration. However far the analysis be carried, we never arrive at point-instants, but only at durations which have themselves a time-span, and so within themselves allow of a distinction between the earlier and the later components of which they are made up. For the same reason, since physical events are never merely in time, but always constitute the four-dimensional continuum of space-time, they are likewise endlessly analyzable in their spatial aspect.

The notion of point-instants can be accepted only as an ideal limit, arrived at by the "method of extensive abstraction."

A street accident is an instance of what Whitehead means by an event. Its occurrence may occupy, say, thirty seconds: within that period the constituent events which make up the accident can be discriminated. We have seen the man hit by the vehicle; we have seen him fall; and the wheel of the vehicle pass over his body. But if so, are we not, in describing the accident as an event, really using that term, in a merely popular manner, to cover what is in itself a series of events? To this criticism Whitehead replies that it is just as legitimate or illegitimate to name the accident as a whole an event as to describe in that way any one of its constituent events of shorter duration, such as the man's being hit or falling. These also are really series of events. For even if we limit the term event to what we can experience, as we say, at a single instant, we find that this is determined by the nature of our senses, and by the span of our consciousness. The retinal processes being of a chemical nature cannot discriminate stimuli that fall upon the retina at a shorter interval than one-eighth of a second; and accordingly the maximum number of discriminable events that we can experience through sight in thirty seconds is two hundred and forty. But as science can demonstrate, by means of indirectly obtained evidence, there are immensely more than two hundred and forty events in a street accident; they have to be numbered by millions; and even so, we should not reach a point-event. So far from reaching reality by such a process of limiting down the duration of events, we find that the further we proceed the more of reality we leave out, and that we have made this sacrifice to no effect, since what is left over still continues to preserve those objectionable features—duration in time and extension in space—the features that started us off on the wild-goose chase, to escape them.

Accordingly, Whitehead admonishes us, we had just as well begin by recognizing what we are constrained in the end, willy-

nilly, to recognize, that events have duration. Nature is not in clock-time but in duration; and duration exists only in slabs, be the slabs longer or be they shorter. To this cause, he argues, is due that "unexhaustiveness [which] is an essential character of our knowledge of nature."<sup>1</sup>

But if this be the situation, why has the scientist found it necessary to seek always for the simple, resolving the complex into its smaller constituents both temporal and spatial? Why has the scientist been constrained to invent all those instruments of precision, the clock, the balance, the thermometer, the microscope and the like, whereby finer and finer discriminations in time, space, and quantity in general are obtained? Why are these instruments indispensable, if analysis, however far we carry it, only lands us face to face with the same unsolved problems as those from which we start?

In reply to this objection, Whitehead develops one of the most interesting and valuable parts of his argument—an explanation, in terms of his theory, of why it is that all natural science, as he fully recognizes, is directed to the endeavor to explain the complex in terms of the laws and nature of its simpler constituents. This, however, is a part of his teaching upon which I shall not dwell.

There is another, and much more fundamental, objection which has to be met. On the traditional view what now exists has always existed; matter once there is there for good and all; the transitory shapes and forms which time carves out of it are alone new; what is new is transitory, and what is abiding never really changes. Matter is thus conceived as a kind of stuff or material, abidingly there, and always being re-made over, thrifty nature making it down, as it were, like a parental garment, for the younger generations:

Imperial Caesar, dead and turned to clay,  
[May] stop a hole to keep the wind away.

<sup>1</sup> *The Concept of Nature*, p. 14.

This view Whitehead summons us to give up, as no longer tenable. But before we can do so, a seemingly insuperable difficulty must be overcome. Popularly we distinguish between things and events. We do not conceive a street accident as a thing or object; and if we tried to do so, we should not succeed; it refuses to stand still. But now Whitehead appears to be asking us to consider a table or a chair as an event; and that, surely, is equally impossible; they refuse to get under way. An abiding thing stands in essential contrast to the events which may happen to it.

To this difficulty Whitehead has a twofold reply. In the first place, he gets some little amusement out of his readers by seeming to question whether the difficulty is a genuine one. Is it true, he asks, that a street accident is an event, and that what we call a thing is not? Take Cleopatra's Needle as it stands on the Embankment in London. It is true that the street accident happens and is done with, whereas Cleopatra's Needle is there day and night, year in, year out, looking down, in abiding contrast, on the stream of traffic that flows by it on the river and on the roadway. But there was a time when there was no Cleopatra's Needle either on the Embankment or in Egypt; it is disintegrating with fabulous slowness, but still continuously, and there must come a time when it will be no longer there. In this regard the difference between it and the street accident would seem to be merely one of time-span. Ultimate difference there appears to be none.

But this is only Whitehead's way of awakening the reflective reader to a better appreciation of his own difficulty. For, as Whitehead proceeds to emphasize, there is a quite radical distinction between events and things or objects. And he enumerates objects as being of three types: sense-objects, such as a sound or a color; perceptual objects, such as a chair or living organism; scientific objects, such as molecules, atoms, and electrons. There is, he recognizes, a fundamental distinction in nature between all such objects and events. An event is unique;



it happens once, and it cannot happen again; once it is over, it is done with. By a thing or object, on the other hand, we mean just that which can be met with at different times, which can appear and disappear, and yet remain the same identical being. Otherwise expressed, the distinction is this: an event cannot be recognized; since every event is unique, and can occur only once, it cannot recur, and so allow of its being recognized as something experienced at some previous time. Since, however, we do recognize objects as previously experienced, there must be some ultimate distinction between them and events.

At first sight there may appear to be an easy way of escape from this conclusion. Though the same event never recurs, events may none the less be uniform in type, and so may resemble one another. May we not therefore recognize events, in the sense of recognizing the type to which they conform; and may we not do so though there is no self-identical sameness in the sense of recurrence? If I meet a man whom I have never seen before, I cannot, of course, recognize him as an individual but I certainly can recognize him as being a man. I can recognize in him a standard type, though I cannot recognize in him recurrent individuality.

But what do we mean by fixity of type or standard: what do we mean by resemblance? All such phrases, in which the terms type, pattern, structure, occur, involve the notion of permanence in some form, and consequently imply that which is irreducible to the non-recurrent uniqueness of events.

The distinction between objects and events is indeed fundamental; the only question is as to how the two types of existence are to be conceived as standing to one another. According to the traditional standpoint, it is space and time on the one hand, and abiding particles on the other, that make events possible; the events are the adventures which befall the particles. The alternative method of procedure is that which Whitehead advocates—so to recast our fundamental modes of conceiving natural existence as to recognize that space and time are abstractions,

not prior-existing conditions making events possible, and that it is equally illegitimate to conceive matter or ether as a kind of stuff, extended in space and with parts movable in space-time. What we alone immediately experience are events, not detached events standing in serial order in time, but events that always overlap and so together constitute the one total durational event that is nature at any assignable period. Our problem is to explain how, this being so, the distinction between events and objects comes to be drawn, how it is possible, and what it involves. We know space and time only as elements involved in events; we know so-called objects only in and through events. How, then, out of a matrix of continuously changing events, do those relatively isolable aspects of reality, space and time, and those relatively permanent things which we call objects, ever come to emerge? And once they have through our intellectual discriminations come to emerge, what kind of ontological status do they possess?

Obviously such a standpoint demands a very complete transformation of the conceptual foundations of the natural sciences. To borrow a metaphor from Whitehead, "recourse to metaphysics is like throwing a match into a powder magazine." Since metaphysical matches are frequent, rather poor in quality, usually when this is done nothing very particular happens. But when the fuse is of the kind manufactured by Whitehead, the trouble is rather that too much happens; "the whole arena is blown up." However, this arena, according to Whitehead, was a structure of unhappy design; and when it is demolished, what is left is the true natural world as it has always existed, and such as we shall know more adequately when viewed through the spectacles which he is ready to supply. We shall then realize that nature is falsely apprehended, when interpreted primarily in terms of the conservation of mass and energy, that is, when we regard it as a kind of self-winding clock, the character of which has been determined once and for all, and which marks time in more senses than one; and that

we should rather conceive nature as an historical being, that is, as a process which at each and every moment is "creatively advancing into novelty."

Even if it were feasible to discuss within the limits of this paper the many difficult problems of scientific methodology to which this very novel manner of envisaging nature at once gives rise, I am not qualified to do so. There are just two points, of a more purely philosophical character, upon which I shall dwell: first, Whitehead's criticism of the fallacy which he entitles "the bifurcation of Nature"; and secondly, that view of the function of reason which, as it seems to me, Whitehead's interpretation of nature illustrates and reinforces.

When Whitehead tells us that all present-day natural philosophy is vitiated by the fallacy of bifurcation, he means that it commits us to a quite untenable division of the components of objective nature into two diametrically opposed types of existence, the material and the mental; or to employ a more adequate pair of terms, the physical and the psychical.

That some such dualism is, upon the traditional view, quite inevitable, first came to be appreciated in the 17th and 18th centuries, owing to the development of the transmission theories of sound, of light and of heat. Physical sound has been found to be a wave movement in air. Light and radiant heat have turned out to be vibrations in ether. Sound, heat, and color, having been thus found to bear not the least resemblance to their physical counterparts, they must, it was argued, be mental creations, psychic additions to reality.

The doctrine which Whitehead thus entitles the bifurcation of nature, and which largely coincides with what is more usually termed the doctrine of representative perception, has in the past two centuries had all the prestige of science behind it. Philosophical thinkers, from time to time, have raised objections to it; but so long as the results of science seemed to support it, these criticisms passed idly over men's heads. Now, however, that Whitehead, in the name of science, is telling us that for



the sake of science itself the doctrine must be eradicated from our thinking, some headway may at last be made.

Galileo, being the first to formulate the standpoint of modern physics, was also the first to distinguish between the primary and the secondary qualities of bodies. All the secondary qualities, he taught, are non-objective; in so far as we apprehend objects in terms of them, we apprehend them falsely.

The main reason which constrained Galileo to adopt this position is quite fundamental, and was already evident to the early Greek thinkers. The mythological stories relating to the Gods proceeded on the assumption that creation and annihilation are real occurrences; and the Greek philosophers at once recognized that so long as this assumption is made the nature of things must remain opaque to the human understanding, and that no scientific knowledge can be possible. Accordingly they set themselves to formulate an account of the real which would not be committed to any such postulate. But this task, as they found, is not at all an easy one. For if there be anything that is fundamental in our sense-experience, it is the fact of qualitative change. A hot object becomes cold; that is to say, heat vanishes out of existence and cold, a something which did not exist before, takes its place. When, therefore, we recognize such an occurrence as coming about, are we not admitting the fact of annihilation and creation just as truly as when we accept any of the stories of the doings of the Gods? What, then, they asked, is to be done? Just what Galileo did, some two thousand years later, though less definitely and less persuasively, since the science of dynamics had not yet been established. We must, it would seem, recognize that bodies are in themselves neither hot nor cold; that all such qualities are appearances, mental entities. Nature consists of matter and motion, and of nothing else; and both matter and motion are alike ingenerable and indestructible. There is a fixed and abiding amount of matter, and a fixed, abiding amount of motion. The particles of matter move about in space, but none of them ever either come into existence or



pass away. Motion is similarly ingenerable and indestructible, though, as essentially non-static, it is always in process of altering its distribution, playing, as it were, a never-ending game of musical chairs with the physical particles.

When this philosophy of nature is adopted, the way is clear. Qualities do not exist in nature, and therefore qualitative change has not to be reckoned with by the physicist. There is no longer any difficulty in conceiving how a hot body becomes cold. When the body is, as we say, hot, its particles are vibrating violently; when it becomes, as we say, cold, its particles lose some of their motion to other particles. Nothing has occurred save only a redistribution of the same total amount of motion among the same ever-abiding particles.

From the point of view of physics, this has proved a very satisfactory position. But, then, look at it from the other end! Consider the unhappy quandary in which the psychologist and the philosopher are placed! They have still to reckon with qualitative change, and to reckon with it in a peculiarly aggravated form. All that is constant in nature is alleged to be physical; and what remains as mental is, so far as can be seen, constantly coming into being and then passing away into nothingness. For, though the psychologist is more than willing to model his behavior on that of the scientist, he cannot do so in this particular respect. The physicist has got rid of the problems of qualitative change by shouldering them off into the mental realm; but the psychologist cannot do likewise, and shoulder them off in turn on to someone else. There is no further realm, no intellectual Hell, so to speak, into which they can be cast. The psychologist is up against them; and they stare him down. If, therefore, the fields of mental philosophy are to be thus treated as a kind of dumping-ground for all those happenings which are too discreditable to be allowed as belonging to physical nature, then only outside the bounds of philosophy, only in the strictly physical domain, will knowledge be possible.

But why, it may be urged, should we be surprised to find it so? The world is a sufficiently strange place, and this may very well be the nature of its strangeness. Why not accept the subjectivity of the secondary qualities, and in the manner of the old-fashioned epiphenomenal view of consciousness reconcile ourselves to the futility of mind, as incapable of inserting itself into the closed system of nature. That even so large a section of experience as the strictly physical can be successfully rationalized, is this not even more than we could antecedently have reasonably expected? Because, as miraculously happens, science is possible, does it at all follow that philosophy must be so likewise?

To these questions there is, however, an answer—whether sufficient or not, time alone can prove. Had any such pusillanimous attitude been maintained toward physical nature, the difficulties which have lain in the way of scientific insight would never have been overcome. When problems, within the realm of physical nature, have proved insoluble, the reason has invariably been found to lie in some false assumption for which we ourselves, and not the problems dealt with, are responsible. The probabilities, therefore, so far as known, are in favor of Whitehead's conviction that a view of nature which leads to such an intellectual *impasse*, is hardly likely to prove ultimately tenable.

To repeat: the reason why the physicist bifurcates objective nature into physical and psychical components, and counts the secondary qualities as belonging to the latter class, is that he is unable, by means of his physical principles, to explain either their coming to be or their ceasing to be. Indeed, from his point of view, it would be more satisfactory if they did not exist at all. So far as he can discover, they make no difference in the behavior of the bodies in which they are found. A red billiard ball acts on a white ball in precisely the same manner as a green one. Indeed, only so is the game possible, as fair and square between the players. Where the colors do come in,

to make a difference, is solely in the behavior of the players: the colors enable them to identify which ball is which. The colors, that is to say, first come in just where, through the intervention of life, or at least of consciousness, reality displays that degree and kind of qualitative complexity which marks the limit beyond which, on the traditional view, no scientific knowledge, at least of the explanatory type, is any longer possible. Since, it is argued, the behavior of physical entities is completely accounted for in the absence of the secondary qualities, these qualities must fall outside physical nature, and must, like consciousness, be irrelevant to it.

But is not a very large assumption being here made? Do the actual methods and the positive results of physical science constrain us to any such attitude? Are not Galileo's teaching and the similar teaching of Descartes determined by misunderstanding of what it is that physical science is really doing? In particular, are we justified in assuming that science is yet in a position to explain the behavior of bodies? It does so to the extent that it establishes certain correlations which we presume to be causally determined; but the causal determinations, if there, are never themselves brought to view. This may be taken as having been proved, once for all, by David Hume. Thus, in studying the manner in which—to keep to Hume's own illustration—one billiard ball moves another, all that the physicist can do is to define the correlations between changes in the shape and stopping of the one ball and corresponding changes of shape and motion in the other ball. But if this be all that is done, and if the physicist, as is undeniable, can establish similar correlations between the secondary qualities and their physical and physiological antecedents and accompaniments, what right have we to exclude colors, sounds, etc., from the physical domain? By means of these correlations the secondary qualities are as inextricably bound up with the other items in objective nature as are the primary. Thereby we do not, indeed, explain how it is possible that they should occur; but does that

differentiate them from any other of nature's happenings? Are we not justified in holding that colors are as truly physical as are the bodily organs of sight, and sounds as truly physical as are the organs of hearing? These organs are telepathic; they discharge their functions by enabling us to apprehend what exists in places where our organisms are not themselves located; and they do so in and through the secondary qualities. We cannot observe a distant object save as it is outlined against a background; and this is only possible through color variations. In the absence of color, as in the dark, the eyes are as good as non-existent. Similarly, if there be no sounds, the ears are entirely useless. To treat the bodily organs as strictly physical, and the qualities of color and sound as purely psychical, is surely to substitute for nature's complex but unitary workings the crude and incredible simplicities of a cast-iron dualism, the sole justification for which is the supposed adequacy of the Newtonian physics, and the supposedly closed character of the physical system as therein conceived.

The traditional philosophy of nature certainly proceeds in strict accordance with the logic of its own avowed principles. On the traditional view nature, at any chosen time, can have only instantaneous existence. In the sequence of its events, only one event at a time, and that in the order of the sequence, can be allowed as existing. Now physics teaches that at least two complete air-waves of the same length are required for the possibility of a musical sound. But since each single wave, or rather each instantaneous state of each wave, alone exists at any one moment, it is impossible for the sound to exist as a physical entity; and we must, it would therefore seem, conclude that it belongs to the only other type in which reality is known to exist, namely, the psychical. If nature can exist only as the instantaneous, everything which, like sound, involves the telescoping or integrating of successive events must be psychically conditioned. The same argument applies to color. Red, according to physics, integrates the happening of millions of events



in ether, and is therefore patently incapable of having physical existence in an instantaneous time.

But does not this desperate expedient of bringing in the mind, as the supposed creative source of sound and color, fail of its purpose? In face, on the one hand, of the many correlations which have been established between the secondary qualities and their physical and physiological accompaniments, and on the other hand of the absence of any similar known correlations in the psychical sphere, is not such procedure suspiciously indicative of some radical defect in the assumptions which are being made, and especially in the assumption that outside the mind only that can exist which exists in an instant?

Let us take, as our illustration, a melody, such as the song of the nightingale. Is it impossible that such a melody should exist as an item in physical nature? The melody, as extending over a sequence of events, demands for its apprehension as melody certain mental processes, namely, those which make possible recollection and anticipation. Must not the melody, therefore, as an integration of the non-instantaneous, be classed as itself mental?

Beyond all possibility of questioning, processes of recollection and anticipation do thus condition our *awareness* of the melody. The melody, as a whole, is apprehended in and through such processes, and they form a sequence. But because these processes condition the *awareness*, it does not follow that the melody which surprises and delights us when the awareness thus reveals it, must itself be similarly conditioned. That view, Whitehead maintains, originates in a false view of time. On his doctrine of duration, the melody takes its place alongside the secondary qualities as a possible item in objective nature. The song of the nightingale can belong to the objective order; only our awareness of it need be reckoned as mental.

The difficulties which arise in connection with this question center, you will observe, in and about Whitehead's fundamental distinction between events and objects. Most of Whitehead's

readers must have wished that he had dwelt upon this distinction at greater length, and in particular that he had stated more explicitly his reasons for classing sounds, colors and the like, as being objects, and not events. The major part of his argument is designed to show that the reasons assigned for classing *sensa* as mental are quite inconclusive, and that certain of these reasons are demonstrably invalid. But we can accept this part of his teaching, and therefore can count sound and melodies as being items in objective nature, and yet not feel committed to the further contention that they are persistent and recurrent objects, and as such condition recognition.

There are, of course, many good reasons why this part of Whitehead's teaching should present special difficulty. He is here treating of that most troublesome of all logical problems, the possibility and status of universals. The question, however, as to whether *sensa* can be classed as objects is capable of being discussed in and by itself; and that Whitehead has nowhere done in any detail. The objections to the position which he is maintaining are many and obvious. He would seem to be adopting, in regard to *sensa*, that very view which he denounces in regard to matter. He would seem to be contending that sounds never come into existence nor pass out of existence. Consequently, on Whitehead's view, I may be using some of the self-identical vowel or other sounds of which Julius Caesar availed himself during his campaign in Gaul. Their having been heard in Europe, and that so many centuries ago, need be no obstacle to their also being present here with us *in propria persona*. Indeed, Whitehead is prepared to go even farther, and to maintain that since sounds are objects and not events, the same sounds can be in more than one place at a time; they can, for instance, be in all parts of this room at once. But most of us, probably, will, until better evidence is shown, continue to hold to the more usual contrary view, namely, that *sensa* are events, and, like other physical happenings, are non-recurrent. We shall hold that the sounds which Caesar heard, when

he or others spoke, were heard but once, and, like the slabs of duration which they constituted, can never again appear within the historical series.

But let us follow the further stages in the argument in which Whitehead defines more precisely his distinction between events and objects. Events, he tells us, make their entry only in order to take their exit. They perish, for good and all, in the very time of their occurring. An object, on the other hand, has, so to speak, an immortality which enables it to survive not only the mental events in and through which it is experienced, but also the physical events in and through which it obtains its diverse locations in time and space. And if a melody be an object, this must likewise be true of it. We have heard the song of the nightingale; we hear it again years after, and say: "There it is again, the same melody that I heard before." Is this only a manner of speaking; or does the melody really have the immortality which Keats so fancifully ascribed to the bird that voices it? The traditional view has a very definite answer to this question. The nervous system of the nightingale has a fixed type of structure, handed down from generation to generation. Hence the uniformity of its behavior; only so is it able to delight us in this twentieth century as it delighted the Greeks in classical times. It is not the melody which persists, but a type of structure in nervous matter, physically conditioned.

But it is precisely upon this position that Whitehead proceeds to train his heaviest artillery. So long as the argument concerns only the secondary qualities and such entities as a melody, there are so many difficulties, and so little specific evidence, that decisive conclusions can hardly be looked for. The situation undergoes change, and as it would seem very decisively in Whitehead's favor, when we limit the discussion to the physical field, as ordinarily conceived. For it is in this domain that his view of duration, if accepted, most clearly displays its revolutionary character. The traditional physics will not countenance persistent melodies, but it does believe

in what, as Whitehead is prepared to show, are more or less in the same class therewith, namely, persistent electrons, atoms and molecules. These, Whitehead argues, cannot exist, any more than the secondary qualities, if nature be viewed as instantaneous.

Whitehead takes as an example the molecule of iron.

Consider a molecule of iron. It is composed of a central core of positive electricity surrounded by annular clusters of electrons, composed of negative electricity and rotating round the core. No single characteristic property of iron as such can be manifested at an instant. Instantaneously there is simply a distribution of electricity and Maxwell's equations are required to express our expectations. But iron is not an expectation or even a recollection. It is a fact; and this fact, which is iron, is what happens during a period of time. . . . There is no such thing as iron at an instant; to be iron is a [constant and recurrent] character of an event. Every physical constant respecting iron which appears in scientific tables is the register of such a character. What is ultimate in iron, according to the traditional theory, is [not iron but] instantaneous distributions of electricity; and this ultimateness is simply ascribed by reason of a metaphysical theory, and by no reason of observation. In truth, when we have once admitted the hierarchy of macroscopic and microscopic equations, the traditional concept is lost. For it is the macroscopic equations which express the facts of immediate observation, and these equations essentially express the integral characters of events. But that hierarchy [the macroscopic referring to what is integrated and the microscopic to the instantaneous] is necessitated by every concept of modern physics—the molecular theory of matter, the dynamical theory of heat, the wave theory of light, the electromagnetic theory of molecules, the electromagnetic theory of mass.<sup>2</sup>

This view Whitehead extends to the living organism. The organism must, he maintains, be interpreted in the same general manner as atoms and molecules. By its existence it demonstrates the physical reality of certain rhythmic functionings which, as such, are incapable of being enclosed within the instantaneous. As rhythmic, they presuppose duration as truly as does a melody. "Life is too obstinately concrete" to be located in an instant, even if at the instant it be spread over a space. For this reason, living organisms, for their definition, demand

<sup>2</sup> *An Enquiry Concerning the Principles of Natural Knowledge*, pp. 22-23.



synoptic as well as analytic treatment. In so far as they are complex, analysis is required to determine the precise nature of their complexities; but in so far as they are rhythmic, these complexities are subordinate to, and determined by, the unities which they constitute. When, therefore, the extreme mechanists endeavor to view the unity of the organism as something which can be exhaustively accounted for as a resultant of the interactions of its parts, they would appear to be developing a very fruitful scientific technique into philosophical consequences which it need not imply. The behaviorists, in unflinching devotion to a strictly logical consistency, are prepared to go even farther, and to deny the effective existence of anything that can properly be entitled consciousness. Behaviorism—may we not say?—is the *enfant terrible* of this way of thinking.

Whitehead completes his indictment of the traditional philosophy of nature, by showing that there are yet other items which the classical physics itself recognizes and which yet can find no foothold in the world so conceived. As Whitehead shows by detailed argument, this is true of such factors as velocity, acceleration, momentum, stress, mass, and kinetic energy, and even of so seemingly ultimate a feature as that of contact. Such factors are, indeed, made use of by the classical physics, just as are the secondary qualities; otherwise physics could not get along at all. But, as Whitehead maintains, it does so, in each case, only by inconsistently doing violence either to its own principles or to the facts as it has itself defined them. If, therefore, the secondary qualities are to be ejected from the system of instantaneous nature, so much else must follow on their heels, that, in consequence of these migrations, physical nature will become so shadowy and unsubstantial that quite palpably the title 'reality' will belong more properly to what lies outside it than to what it itself continues to include. "The ideal [is that] of all nature with no temporal extension, . . . of all nature at an instant. But this ideal is in fact the ideal of a nonentity."<sup>3</sup>

<sup>3</sup> *The Concept of Nature*, p. 61.

Is not this, indeed, the reason of what surely is a highly paradoxical situation: namely, that if we wish to discover, in these modern times, a whole-hearted adherent of Bishop Berkeley's view of the function of science, as consisting merely in the determination of the coexistences and sequences of our sensations, we have to search for him in the ranks of the students of the natural sciences? In Karl Pearson and in Ernst Mach—the latter of whom has exercised considerable influence upon Einstein—the wheel has gone full circle. Nature, for them, has come to be located, together with the secondary qualities, merely and exclusively in the subjective experiences of this and that individual. The fundamental concepts of science, whether of mass and energy or of molecules and electrons, are, they declare, merely working fictions, and can be justified only by certain practical services which they discharge.

The remedy, according to Whitehead, lies in a radical revision of our fundamental assumptions. We may not thus pick and choose among nature's components. We must keep to nature, explaining it in terms of itself, and not of any outside entity, such as mind. The type of problem with which science, properly understood, will have to deal will then no longer be: how a billiard ball causes the mind to see red or green; but the problem: when red is found in nature, what else is found there in addition. Under guidance of this question, we shall no longer discuss the causes of knowledge, but the coherence of the known. The understanding which we shall seek is an understanding of relations within nature, not of relations between nature and a something called mind, supposed to lie outside it.

"All we know of nature is in the same boat, to sink or swim together."<sup>4</sup>  
 "For us the red glow of the sunset should be as much part of nature as are [its] molecules and electric waves. . . . It is for natural philosophy to analyze how these various elements of nature are connected. . . . We are instinctively willing to believe that by due attention more can be found in nature than that which is observed at first sight. But we will not be content with less."<sup>5</sup>

<sup>4</sup> *The Concept of Nature*, p. 148.      <sup>5</sup> *Op. cit.*, p. 29.

To describe any of the items of nature as mental in character is not only to deprive them of their legitimate birthright, but in mockery to offer, as substitute, what in this connection is a quite empty and meaningless title. This device of bringing in the animal and human mind as a supposedly creative source of new entities, really avails nothing in rendering intelligible the occurrence of these entities, or the part which they unquestionably play in animal and human behavior.

Thus nature, as envisaged by Whitehead, is extraordinarily different from nature as defined in terms of the classical physics. While less tidy, with all sorts of loose ends, it is allowed to have more content; and in proportion as it has become more bewildering, just thereby it has become more and more like unto the reality which faces us in experience. In view of the amazing diversity of the items which, on Whitehead's view, compose nature—the tastes as well as the textures of foods, the roar of the lion and the song of the nightingale as well as the labyrinthine structures of the inner ear, the gorgeous coloration of the peacock's tail as well as the rods and cones of the retina—nature, thus envisaged, will at every turn, to the great benefit of our openmindedness, force upon our attention the immense gaps, not merely in our detailed and established theories, but also even in our most conjectural interpretations of nature's doings. We may allow the imagination to suggest all manner of possible possibilities beyond the actualities which we are in position to verify; but we shall not thereby succeed in comprehending, even distantly, in bare outline, how these gaps can be bridged—not at least if, as we ought, we insist upon retaining belief in the continuity which is so fundamental, and, as we have good grounds for believing, so universal a feature of all reality.

On the traditional view—only a generation ago Tyndall and Huxley were speaking of atoms as the foundation stones of the universe—the ultimate constituents and the possible types of combination are supposed to be already more or less known; and for science it only remains to determine the particular ever-

changing combinations which occur in this and that space at this and that time. On Whitehead's view, on the other hand, even nature's most usual and seemingly ordinary features are but hieroglyphics which bear a wealth of meaning beyond all that we have yet succeeded in discerning.

"The materialistic theory has all the completeness of the thought of the middle ages, which had a complete answer to everything, be it in heaven or in hell or in nature. There is a trimness about it, with its instantaneous present, its vanished past, its non-existent future, and its inert matter. This trimness is very medieval and ill accords with brute fact. The theory which I am urging admits a greater ultimate mystery and a deeper ignorance."<sup>6</sup> "We are apt to fall into the error of thinking that the facts are simple because simplicity is the goal of our quest. The guiding motto in the life of every natural philosopher should be, Seek simplicity and distrust it."<sup>7</sup> "We have to remember that while nature is complex with timeless subtlety, human thought issues from the simple-mindedness of beings whose life is less than half a century."<sup>8</sup> "All that one can hope to do is to settle the right sort of difficulties and to raise the right sort of ulterior questions, and thus to accomplish one short step further into the unfathomable mystery."<sup>9</sup>

These considerations, and especially this last phrase "the unfathomable mystery," bring me to my second main question, which I must treat more briefly. You will have observed the many respects in which Whitehead's terminology resembles that of Bergson's. Like Bergson, he regards the traditional philosophy of nature as false and distorting; like Bergson, he substitutes duration for the instantaneous present; like Bergson, he speaks of nature as an historical being, and as at every moment creatively advancing into novelty. He also agrees with Bergson that we must start from something directly experienced, and that in proceeding to know it we must do so by widening the field of this experience, not by leaving out more and more of it. Is then Whitehead also committed to Bergson's attack upon reason as incapable of yielding insight into reality, and as finding its proper sphere not in the realm of theory but in the catch-who-catch-can scrimmages of practical life? The question almost

<sup>6</sup> *The Concept of Nature*, p. 73.

<sup>7</sup> *Op. cit.*, p. 163.

<sup>8</sup> *An Enquiry Concerning the Principles of Natural Knowledge*, p. 15.

<sup>9</sup> *Op. cit.*, p. viii.



answers itself. Whitehead has none of Bergson's deep-rooted antipathy to that surely very admirable, if for purposes of transportation very expensive and troublesome, aspect of reality which we entitle space. According to Whitehead, reality is in space no less assuredly than it is in time; and he therefore regards the analytic procedure whereby the physicist explains the given in terms of its simpler components as resulting in genuine knowledge, and not in distortion of what is intrinsically simple and unitary. Indeed he insists that we should give as literal an interpretation as possible to physical theories regarding the existence and structure of molecules, atoms and electrons. Also, though Whitehead does not believe in a material ether, he does hold that we are committed to acceptance of an ether of events. With this appreciation of analysis, Whitehead holds, however, to much that is more or less distinctive of Bergson; and I shall therefore conclude by considering how far Whitehead's teaching is compatible with an unqualified and whole-hearted belief in rational criteria. This is not a question upon which he has expressed himself in any explicit manner; but it can, I think, be answered in the light of his other utterances.

Those who depreciate reason, in the manner of Bergson, consider that it is too inflexible, too logical, to allow for the freakishness of life, and for the strange and seemingly irrational contingencies of which nature and history offer so many examples. Logic seems out of place when we are faced, as we constantly are, by contingency, factualness, historicity.

Take, for example the fact that Great Britain is an island and is not triangular or equilateral, but grotesquely shaped. Its being an island, with this specific irregular shape, has largely determined the history of England and Scotland. Yet it is strictly factual. Geology can, indeed, give an explanation of these facts; but the explanation consists in running them back to a body of contingencies more primitive but equally factual, and which are as little capable of rational justification as the present distribution of sea and land.

This is typical of all the fundamental facts and conditions of human existence. We cannot by means of reason establish their necessity. The most that we can do is to determine their actual nature and the consequences that follow therefrom. And so doing, we generally succeed in finding that, under the conditions prescribed, a rationality or order appropriate to them, determined by them, gradually discloses itself—an order which is richer and more wonderful than any that unassisted, that is, dialectical, reasoning could ever have anticipated, if called upon to invent what it would desire to discover. It is not, indeed, the task of the human mind to prove the rationality of the universe or any part of it. It is for the universe, on detailed study, to reveal the kind of rationality which does, as a matter of fact, belong to it. Ahead of detailed study, we do not know what, in reference to any specific subject-matter, we ought to mean by rationality. Taken abstractly, in general, we mean by rationality merely that which is at once in harmony with the relevant appearances, and which when formulated in terms of human speech, and thereby embodied in judgments, does not involve direct logical contradictions. But clearly this definition of the rational is purely formal; it is empty of all specific meaning. It does not in the least prefigure what detailed study is likely to disclose: as in physiology, the crossing of the nerve-trunks which makes us leftbrained, or as in grammar the irregular verbs, or as in political history the British Constitution. What the rationalist can alone be required to stand for is the conviction that reality, if known in its details and in all its manifold aspects, will be found to justify itself in face of the claims to which it has given rise in *any* of its embodiments. The rational is for us a *problematic* conception, and only by empirical enquiry, in proportion as such enquiry is successful, can it be progressively defined in its relevant detail.

To all of this Whitehead would, I think, wholeheartedly agree; while Bergson would desire to make certain provisos. For they differ fundamentally, not only in those respects which

I have already enumerated, but also in one other respect which is even more fundamental, namely, that Bergson denies the validity of universals, whereas Whitehead allows them a large and prominent place in his philosophy. According to Bergson there is no fixed structure or constancy in nature to balance, in any reliable manner, the creative processes whereby it advances or emerges into novelty. The gates of the future are so wide open that we have no ground for asserting anything to be either possible or impossible prior to its actual entry into the realm of the actual. It is, Bergson tells us, an illusion that there is, in addition to the actual, any such thing as the possible. When the future has, through creative activities, been rendered actual, it casts back into the past the mirage of its own possibility; and so leads us, if we be not careful in observation, to believe that, had our previous experience been more extensive, we could have anticipated the future prior to its arrival. But if this be the situation, if we cannot know how far the actual will continue to behave as it has hitherto done, and if, indeed, our one certainty in regard to the future is that it must differ from the non-recurrent past, must not some other guide than reason be set in the seat of authority?

To these queries the answer can be made that if with Bergson we deny the existence of universals, if types and patterns are but artificial schemes devised by our analytic and merely anthropomorphic reason, if under the stress of our merely practical need for rhythms and recurrences we are reading them into the ever-changing, freely creative processes of nature, and if, therefore, nothing not already existent can be regarded as being either possible or impossible, then certainly rational criteria cannot be relied upon as a source of theoretical insight. For a vision of the genuinely and independently real we shall have to look to some other source.

But if, on the other hand, we recognize with Whitehead that universals, that is, recurrent rhythms and patterns, are as important and essential a factor in nature as is the uniqueness

of its transitory, non-recurrent events, then the possible at once comes into its own, and reason is therewith reinstated in authority. For is it not, above all else, with the possible that reason, *quâ* reason, is primarily concerned?<sup>10</sup> And that not because reason is detached from, or indifferent to, the actual, but because only through study of the possible can the actual, in its many concealed aspects, come to be known.

What, for instance, does the scientist do when he makes an experiment? Constructing an hypothesis, in the light of his acquired experience and knowledge, he conceives a situation which has never been actualized in nature, or which at least has never been disclosed to him or to others in actual experience. This situation he sets about producing with the artificial aids which his laboratory supplies; and according as its outcome is or is not in accordance with his predictions, he confirms, modifies, or rejects his hypothetically inferred conclusions. The possibilities which he thus hypothetically entertains may, more often than not, be akin to the mirages of which Bergson speaks; but ever and anon he finds that by their means he has entered more deeply into the constitution of the real. Through study of possibilities he discovers for himself fresh data by reasoning upon which he can make further advances in the building up of knowledge.

Even when the hypotheses fail, they frequently, in failing, yield data which, if not positively, at least negatively, mark out the boundaries between the true and the false. They afford clues, by further reflection upon which possibilities of a more genuine character may be brought into view.

Without attempting to enter into the difficult problems which center round the question as to the nature of universals—and recognizing, as I have said, that on this point Whitehead's own statements are too brief to be altogether satisfactory—it is surely clear that experience does reveal to us actual universals. Particulars resemble one another; they recur, and can be recognized.

<sup>10</sup> I have here profited by recollections of Stout's unpublished Gifford Lectures.



There is permanence of patterns and types; reality has a structure. But this being granted, the possible at once comes into its own. Every universal has possible, as well as actual instances, and the possible instances are, in many cases, in experimental science as in the moral, social and political fields, even more important to us than the actual instances. They are possible only in so far as they are instances of *actual* universals. Our knowledge of them is to that extent empirical. In considering them we are still dealing with reality. We are justified in giving to them the eulogistic title of possibilities, in that they are genuine modes in which the actual, granted the other required conditions, can come to be. Their basis is factual, being found in the present and in the past. In arguing to them we are still arguing in the light of, and under the guidance of, experience.

The reasons why, though actually possible, they are merely possible, is that besides the conditions which make them possible, they demand other conditions not yet actual. Whether these other conditions are themselves possible is one of the questions which we have to settle in the process of considering them. To take, for instance, practical possibilities: in deciding whether we ought to guide our conduct, personal, social, or political, in such manner as to realize certain possibilities, we are deciding two questions which, however difficult, may be quite within our competence. One is as to the possibility of the supplement of conditions required for converting the possibilities into actuality; the other is as to the value of the possibilities thus sought, and the costs of their achievement. Neither question can be entertained, and neither can be solved, save through the instrumentality of reason; and it is in these two types of enquiry that reason proves itself the indispensable ally of all our specifically human activities. Human activities, whether theoretical or practical, are certainly creative; but that which at once inspires and directs them comes from study of the possibilities disclosed to us in experience of existing universals.

Experience fructifies reason; and reason clarifies experience into the anticipation of all that it involves for its greatest possible, and most ideal, extension. The greater constructive thinkers, like Plato, are, as a rule, rational empiricists, or if we please, empirical rationalists. Only thus, they believe, can reliance on reason be harmonized with the prevailing contingency and factualness and historicity of all that is fundamental in human experience, alike in the natural or in the spiritual domains. Reality is full of the unexpected. As Montaigne wisely remarks: "Unknown truths are improbable." But the unexpectedness of the real reveals itself in its universals, no less than in its particulars; and to this extent, even in its wildest vagaries, may come within the scope of our reasoned predictions. As the speculations of Einstein are now demonstrating, science can correctly predict the seemingly incredible. Through insight, genuinely rational in character, it can anticipate the actual prior to its occurrence.

Thus Whitehead, notwithstanding the revolutionary character of his philosophy of nature, is not called upon to question any of the positive results of the natural sciences, nor to condemn any method of enquiry which the natural sciences now fruitfully employ. What he alone questions are the limitations which certain representative scientists, in philosophising upon their results, have sought to impose upon scientific procedure, and by which they have sought to deprive the natural world of a considerable proportion of its observed features. Thus while he recognizes a larger measure of mystery in the proceedings of nature, he does not depart from the rationalist position, that, while we can hardly expect that the human race will ever have advanced so far on the path of knowledge as to have banished mystery, none the less only by the employment and continuous improvement of genuinely scientific methods can we hope to define in what precise manner the features which remain as mysterious have to be reckoned with as actually present.

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